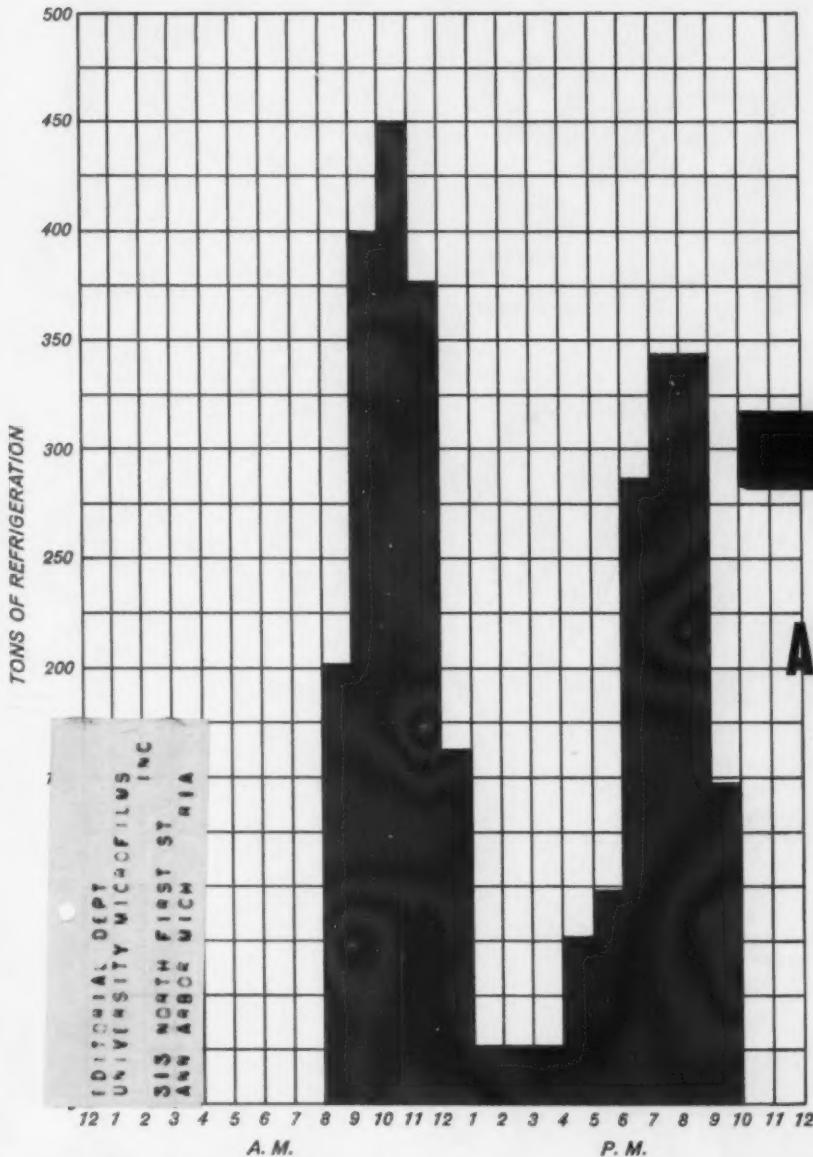


The REFRIGERATION & AIRCONDITIONING Business

MAY 1961



Cooling
load
look like
this?

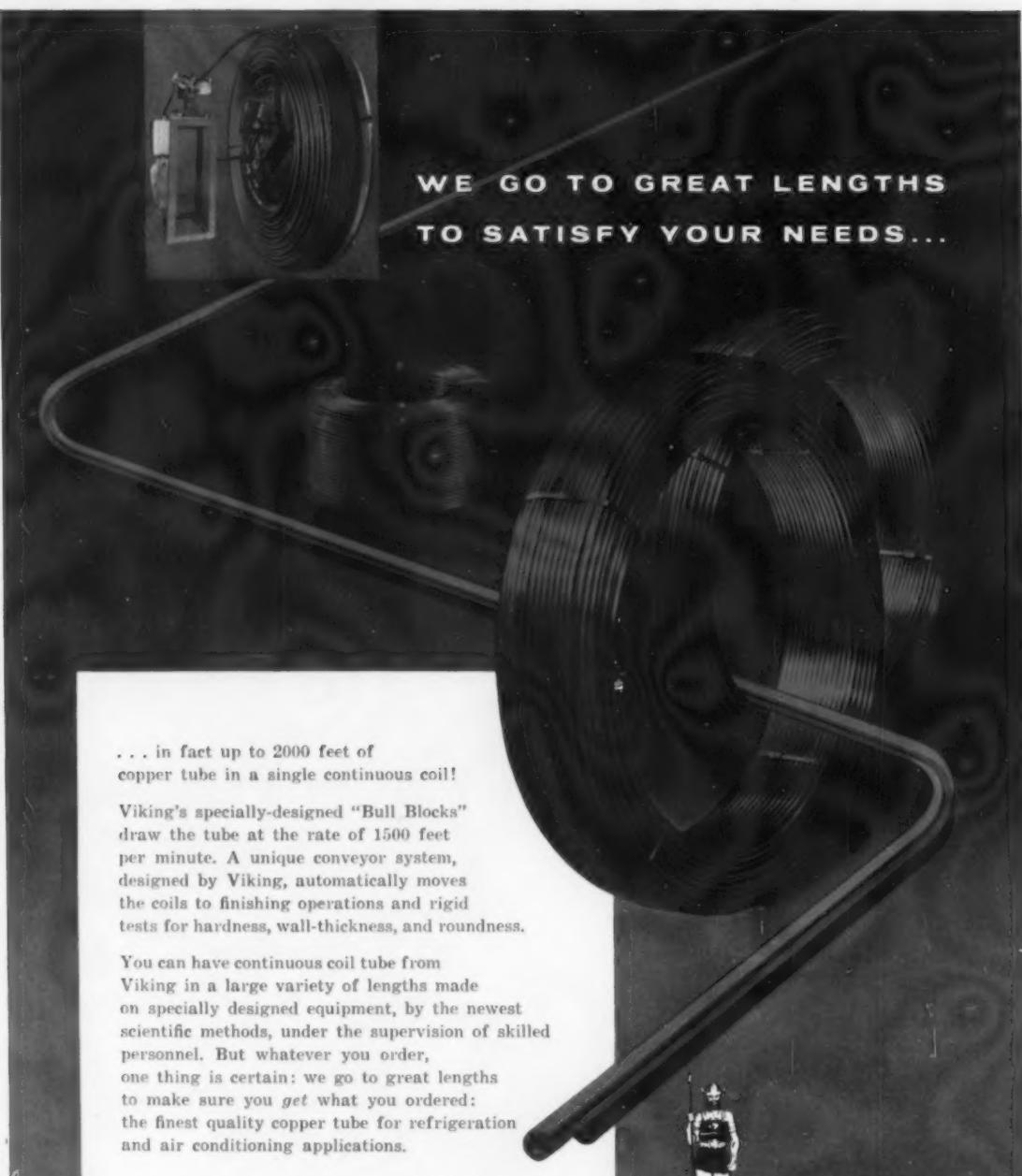
ICE BANK
AIRCONDITIONING
can be
the answer

ALSO IN THIS ISSUE:

- Replacement selling of commercial airconditioners
- Selling supermarkets from the ground up

AN INDUSTRIAL PUBLISHING CORPORATION MAGAZINE

The magazine for the Installing Contractor-Dealer of airconditioning
and commercial and industrial refrigeration



WE GO TO GREAT LENGTHS
TO SATISFY YOUR NEEDS...

... in fact up to 2000 feet of
copper tube in a single continuous coil!

Viking's specially-designed "Bull Blocks"
draw the tube at the rate of 1500 feet
per minute. A unique conveyor system,
designed by Viking, automatically moves
the coils to finishing operations and rigid
tests for hardness, wall-thickness, and roundness.

You can have continuous coil tube from
Viking in a large variety of lengths made
on specially designed equipment, by the newest
scientific methods, under the supervision of skilled
personnel. But whatever you order,
one thing is certain: we go to great lengths
to make sure you get what you ordered:
the finest quality copper tube for refrigeration
and air conditioning applications.

VIKING

COPPER TUBE CO.

CLEVELAND 10, OHIO



circle 85 on reader service card

ALCO

offers the

FIRST and **ONLY**

Silica-Gel P.A. 400

and Molecular Sieve

**BLOCK DESICCANT
FILTER-DRIER**

to the

**REFRIGERATION
INDUSTRY**



Shows
Shock-proof
Construction

Important Advantages and System Benefits:

1. Exclusive Alco binder assures a block of 97% pure desiccant.
2. Manufactured by Alco's specially developed forming process (not pressure moulded)—eliminating packing effect—assuring greater uniformity of flow.
3. Geometry of ADK block exposes maximum surface to adsorb and filter out moisture and fine particles.
4. Directed and even distribution of liquid gives filtration in depth—coupled with short flow path means low pressure drop—longer system life.
5. Rigidly controlled activation—factory sealed.
6. Maximum system protection against acids and other foreign matter.
7. Copper (ODS) fittings mean easy brazing.
8. Brass (SAE) fittings means no flare nut creep.
9. Full flow fittings mean low pressure drop.

ALCO DRI-KLEANER is your insurance for a longer, more trouble-free system life.



- BUY SECURITY
- BUY QUALITY
- BUY ALCO

ALCO VALVE CO.

543 KINGSLAND AVE. • ST. LOUIS 30, MO.

3328

The one complete line of refrigerant controls: Thermostatic Expansion Valves Refrigerant Distributors Solenoid Valves
Refrigerant Filter-Driers Suction Line Regulators Flooded Evaporator Controls and Reversing Valves

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THE REFRIGERATION & AIR CONDITIONING BUSINESS/MAY 1962

SPACE-
TIME-
MONEY

Save All Three with Square D QMB POWER PANELBOARDS



MOTOR STARTERS AND BREAKERS
OR SWITCHES COMBINED IN ONE
SPACE-SAVING PANELBOARD!

FACTORY WIRED AND ASSEMBLED
OR ENCLOSURES AND COMPONENTS
AVAILABLE FROM YOUR
SQUARE D DISTRIBUTOR!

BREAKER AND SWITCH UNITS ARE
EXCLUSIVE PLUG-IN CONSTRUCTION.
INSTALLED OR REARRANGED
IN MINUTES!

If the above installation had been made the old way—with trough, and ganging separate switches and starters—it would have taken at least six feet of wall space instead of 30 inches, and four times the installation time.

After this panelboard is installed, Square D's exclusive PLUG-IN design permits circuit changes without costly down time. For extra safety, plug-in units are mounted directly above starters, permitting interlocking. No starter or disconnect door can be opened when switch is "ON."

QMB panelboards accommodate reversing or non-reversing starters, sizes 0 through 4; plug-in circuit breakers through 225 amperes; plug-in switches through 200 amperes (bolted through 600 amperes).



Twin Unit (above)
available 15-100 amperes

Single Unit available 125-225 amperes

Exclusive Breaker Unit Advantages:

- Plug-in construction • Each unit in individual steel enclosure with dead-front construction
- Combine switch and breaker units in same panelboard, if desired

Write for the complete story—Square D Company, Mercer Road, Lexington, Kentucky



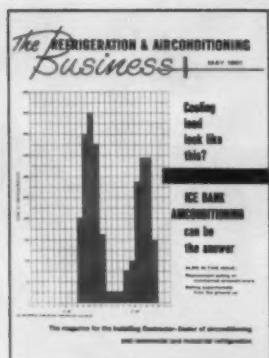
SQUARE D COMPANY

wherever electricity is distributed and controlled

circle 78 on reader service card

MAY 1963/THE REFRIGERATION & AIR CONDITIONING BUSINESS

reader's guide to



for May 1961

COVER FEATURE: Ice bank airconditioning is one phase of the business that many contractors ignore, simply because they don't really understand what it is, how it works, or how they can use it as a competitive advantage in selling certain types of jobs. If you're in this category, turn to page 36 — you'll find all the answers.

FEATURES

JOHN S. ROBINSON
general manager

JIM McCALLUM
editor

RON HENRY
associate editor

GORDON ANDERSON
assistant editor

SCHOLER BANGS
western editor

HENRY LEFER
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refrigeration*

GEORGE C. WEBSTER
*consulting editor
business management*

MARY MARRACINO
editorial assistant

DAVID KINSLER
distilled writing

ALARIC MAUSSER
art director

25 LET'S TALK BUSINESS: editorial of the month

Manufacturers fail to realize the importance of contractors in our industry

36 ICE BANK AIR CONDITIONING CAN BE THE ANSWER

... when you are faced with a job having high peak loads at intervals

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This special Business Report points the way to more profits for contractors

42 HOW BIG IS THE REPLACEMENT MARKET?

Here are some facts and figures that may make you realize what you're missing

43 WHAT CONTRACTORS SAY ABOUT REPLACEMENT SELLING

... points up vividly why some make it pay off and others don't

44 TALK DOLLARS-AND-CENTS TO REPLACEMENT PROSPECTS

This contractor builds his sales story on savings in maintenance costs

46 BUILD A QUALITY REPUTATION IF YOU WANT REPLACEMENT BUSINESS

If you're the best, nobody else will do at any price: that's what this contractor finds

47 CONTRACTOR MEETS CRITICAL TEMPERATURE REQUIREMENTS

... for a gage lab with a system that betters design conditions

48 THIS CONTRACTOR-DEALER HAS ALL THE ANSWERS

... for merchants planning new food markets. He does the whole job.

51 APPLICATIONS MANUAL by Arthur H. Farr

How to detect and treat starting burn-outs in motor-compressors

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BPA



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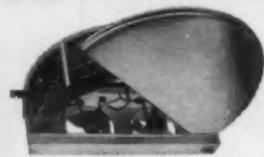
TENNEY



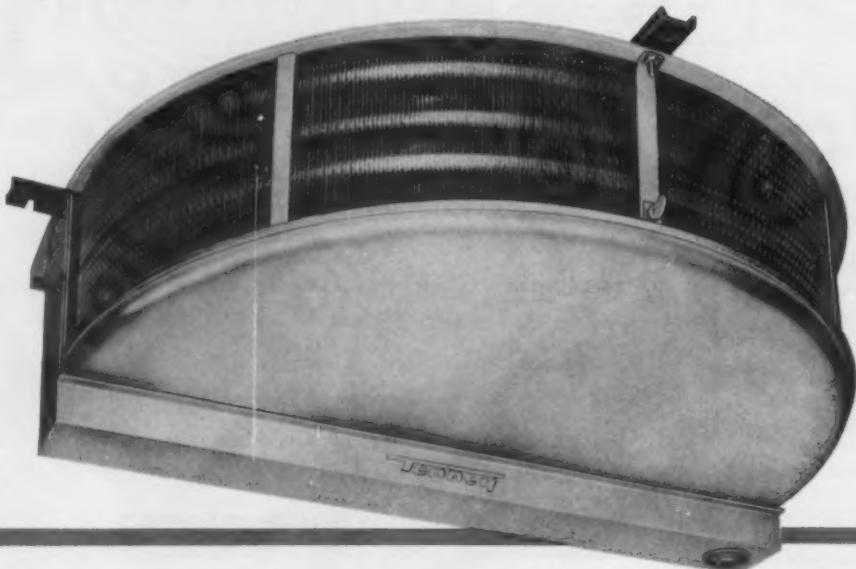
half round...



twin fanned...



easy to service



Tenney TW and TWF unit coolers with ALL-ALUMINUM HOUSINGS!

From 3,700 to 17,000 BTU

More cooling power per square inch and most convenient installation with Tenney's TW and TWF unit coolers than with any other comparable units—and now they're built of lightweight, rustproof aluminum. True half round design insures maximum air distribution. It hugs up tight against the ceiling and its unique design allows maximum product storage. Service is so simple—flick off a thumb screw and the entire

unit is open, with all parts within easy reach. You never disturb existing refrigeration, electrical or water drain lines! And in case of emergency, one of the unit's two fan-and-motor combinations can maintain safe temperatures until help arrives. Standard filters are optional on both units. Write for literature and technical data on these new all-aluminum TW and TWF unit coolers today.



Write for Bulletin 104-54

Engineers and Manufacturers
of Refrigeration and
Environmental Equipment

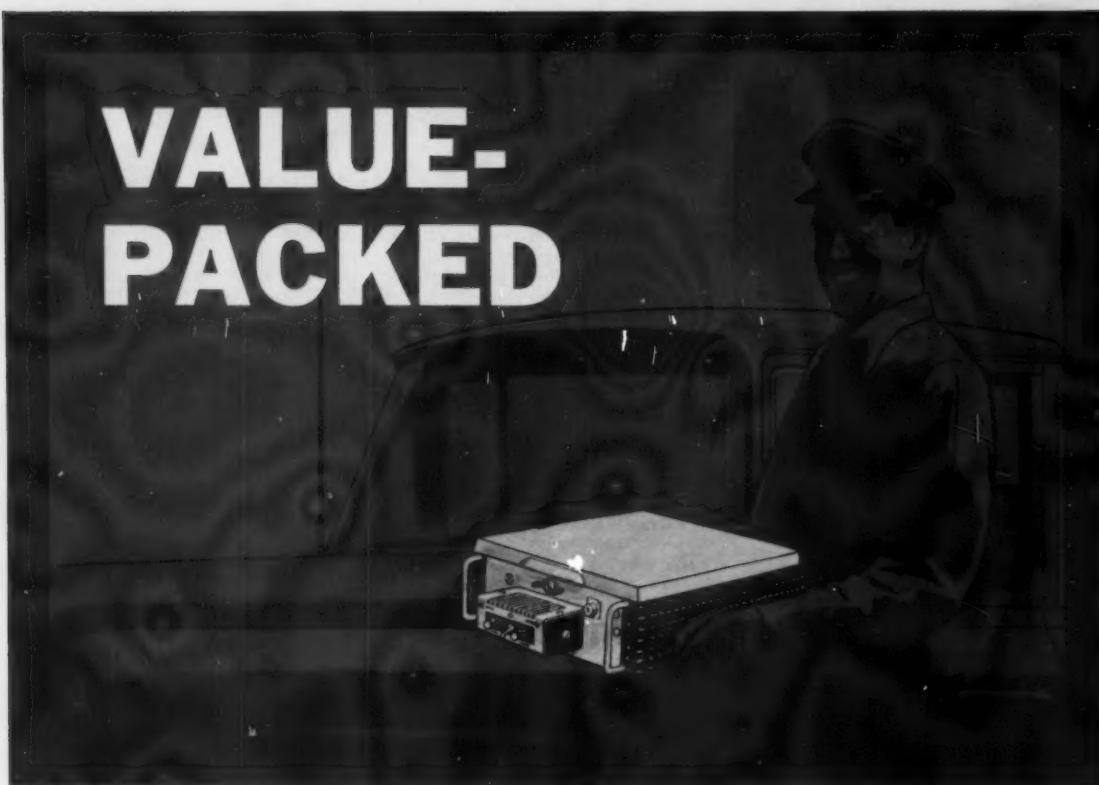
1090 SPRINGFIELD ROAD, UNION, NEW JERSEY

• PLANTS: UNION, NEW JERSEY AND WILMINGTON, NORTH CAROLINA

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Tenney
ENGINEERING, INC.

VALUE-PACKED



Wisely used transistors enhance the value of RCA "LD" 2-Way Radio and give it built-in dependability

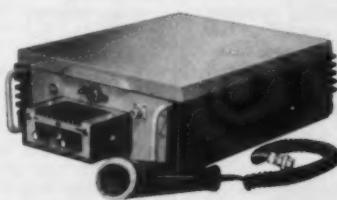
In designing this efficient new "LD" equipment, RCA engineers wisely gave special consideration to the transistor. Only "stock" transistors capable of being serviced with existing test equipment and techniques are used—and only in circuits where they do the best job in cutting battery drain. Tubes are used where they can stand up under high temperatures, heavy voltages—jobs that tubes do best.

As a result the "LD" is not OVERtransistorized, is compact, yet accessible, miserly in power con-

sumption yet value-packed to pack a punch in performance.

Leave the radio on when engine is off—battery drain is negligible. Use it on the roughest roads—transistors and sealed circuits give added assurance it can take it under gruelling conditions.

Specify the RCA "LD" and you can be sure it will stand in back of your endorsement. Lease or purchase plans available. RCA authorized service available. Ask your RCA Representative for complete descriptive literature. Or mail coupon below.



The Most Trusted Name in Radio

RADIO CORPORATION OF AMERICA

THE REFRIGERATION & AIR CONDITIONING BUSINESS/MAY 1961

RADIO CORPORATION OF AMERICA
Telecommunication Center, Dept. U-261
Meadow Lands, Pa.

Please send me FREE literature on the new RCA Transistorized "LD" Mobile Radio.
 Have RCA Communications Specialist contact me and explain why this is today's best value in 2-way radio.

NAME _____ TITLE _____

COMPANY _____

TYPE OF BUSINESS _____

ADDRESS _____ PHONE _____

CITY _____ ZONE _____ STATE _____



circle 65 on reader service card

Product DATA

Airconditioning controls

Product: Compact airconditioning and refrigeration controls - 30 and 40 amp. contactors and starters.

Manufacturer: General Electric Co., Schenectady, N.Y.

Features: New controls require only 4.5 watts, reduction from 3.5 to 9.5 watts over previous forms. Have dust-resistant vertical contacts, optional push-on coil terminals, 3-point keyhole-mounted baseplate. Starters have either quick-trip or standard overload relays.

circle 136 on reader service card

Drink dispenser

Product: Automatic drink dispenser (Model 860).

Manufacturer: Freez King Corp., Chicago, Ill.

Features: Is swivel-mounted and has cap-lift type draw-off, mixing flavor and dispensing drink simultaneously. Pro-



duces up to 300 drinks per hour. Has $\frac{1}{6}$ hp hermetic compressor and $\frac{1}{6}$ hp beater motor. Mix reservoir holds 5 gal. flavor. Stainless steel cabinet.

circle 137 on reader service card

Roof-mounted unit

Product: Model WRA "Roofair" roof-mounted airconditioner.

Manufacturer: Worthington Corp., Harrison, N.J.

Features: Also combination units available with gas, oil, or steam heat for cool-



ing and dehumidification. Includes six models with capacity range from five to 35 tons with standard heating ratings. Self-contained packages shipped factory-assembled as to wiring, piping, charging. Single air distribution chamber provides controlled supply and return air distribution from unit to conditioned space. Also adaptable for ductwork.

circle 138 on reader service card

Biological freezer

Product: Model BF-1 biological freezer using liquid nitrogen.

Manufacturer: Linde Co. Div., Union Carbide Corp., New York, N.Y.

Features: Vaporizes nitrogen in a refrigerator, then vapor moves through transfer tube of freezer into second refrigerator where specimens or materials placed. Will cool, for example, a 1 cc ampule of bull semen to 2°C per minute between -5 and -15°C; then at 3 to 5°C per minute to maximum terminal temperature of -79°C. Some components of freezer are neck tube plug with grooves, aligning collar, and vapor outlets.

circle 139 on reader service card

Suctionline trap

Product: Suction line P-trap that promotes oil migration.

Manufacturer: Mueller Brass Co., Port Huron, Mich.

Features: With trap installed in suction line, oil is drained from horizontal runs approaching risers. Oil then migrates up through riser to compressor in



one of three forms, depending on vapor velocity in line. Velocity can fall as low as 400 fpm. Trap made from one piece of seamless copper tube in $\frac{1}{4}$, $\frac{1}{2}$, and $\frac{3}{4}$ " o.d. ready to be soldered into line.

circle 140 on reader service card

Cooler erection method

Product: "Ease-o-Matic" method of erecting coolers.

Manufacturer: La Crosse Cooler Co., La Crosse, Wis.

Features: Requires only use of a hammer to tightly and accurately position panels as assembled. Also eases expan-

sion of cooler to larger size or dismantling of it for moving. Now available in firm's standard line of high temperature coolers as well as series of 6 and 8" insulated sharp freeze units.

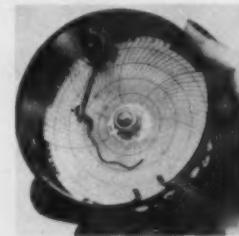
circle 141 on reader service card

Recording thermometer

Product: Thermometer that records temperature for seven days.

Manufacturer: Airserco Mfg. Co., Pittsburgh, Pa.

Features: Temperature recorded on 3% dia. circular chart having dry stylus, moisture-proof paper, and eight-day



spring-driven chart mechanism. Instrument in black anodized aluminum housing, 3-15/16" dia. x 2% high. Interchangeable snap-on actuating elements and wall- or shelf-mounting bracket also available.

circle 142 on reader service card

Removable enclosures

Product: Removable under-window enclosures for air diffusion units.

Manufacturer: Buensod-Stacey Corp., New York, N.Y.

Features: Rigid metal panels are flush with no visible screws, locks, or handles. Access door eliminates protrusions from surface of enclosures. In variety of finishes, including furniture steel, wood veneer, and stainless steel.

circle 143 on reader service card

Bench drawers

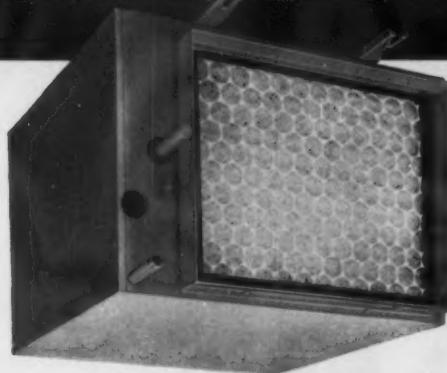
Product: Bench drawers that run on ball bearings.

Manufacturer: Bay Products, Inc., Philadelphia, Pa.

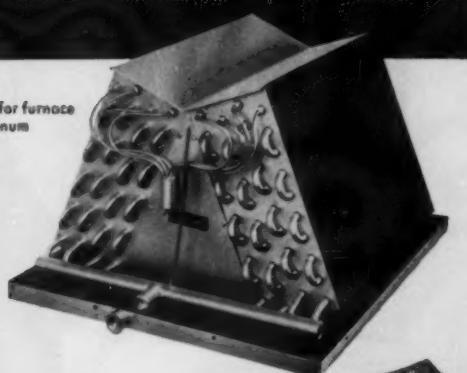
Features: Each drawer mounted in own case so can be stacked below each other beneath bench top. Can also be tiered to form free-standing pedestals that will support a bench top, and solid banks of drawer storage units can be made with tiers of drawers side-by-side. Has sliding tray to keep small parts separate. Are 20 x 5 x 14 or 20" with either padlocking hasp or cylinder lock. Construction is all steel finished in gray baked enamel.

circle 144 on reader service card

Continued on page 82



DAH for new systems in attic or crawl space



FP for furnace plenum



DAC for duct installation
in hot air systems

**COMPACT—EASY TO SELL
AND INSTALL**

LARKIN AIR CONDITIONING COMPONENTS

— 2, 3, 4 and 5-ton Capacities †

It's time to turn the sizzling home air-conditioning market into a piece of cool profit for yourself. One way to make that profit, and hold on to it, is to build custom systems with dependable LARKIN Air Conditioning Components.

A HOST OF STRONG FEATURES

- Available in 2, 3, 4 and 5-ton capacities †
- Equipped with Larkin cross-fin coil, staggered copper tubing with aluminum fins
UL approved
- Evaporator equipped with pressure-type distributor and external equalizer connection
- Insulated drain pan to prevent sweating
- Pre-punched holes for easy installation
- Cases of the DAH and DAC are fully insulated and finished in gray enamel
- The DAH is equipped with centrifugal fan, permanently lubricated motor and throw-away filters

Whether converting existing hot air systems, adding cooling to homes with wet heat, or installing year-round systems in new homes—it will pay you to use quality LARKIN products, priced to give you a competition advantage.

BASIC RATINGS

Model	Capacity Btu/hr*	Cfm	Model	Capacity Btu/hr*	Cfm	Model	Capacity Btu/hr*	Cfm G'/SP
FP-2	25,600	800	DAC-2	25,100	800	DAH-2	24,800	950
FP-3	35,900	1200	DAC-3	37,300	1200	DAH-3	39,400	1375
FP-4	48,100	1600	DAC-4	48,960	1600	DAH-4	54,800	2150
FP-5	61,800	2000	DAC-5	61,200	2000			

*DAH is not available in 4-ton size

*Capacity based on 80° DB 67° WB entering air,
40° F suction temperature, R-12 or R-22 refrigerant.

SEE YOUR WHOLESALER
OR WRITE FOR BULLETIN 1054-B



LARKIN COILS

519 Memorial Drive, S.E. • P.O. Box 1699 • Murray 8-3171

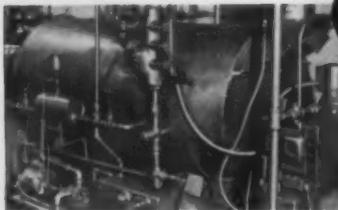
ATLANTA 1, GEORGIA

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THE REFRIGERATION & AIRCONDITIONING BUSINESS/MAY 1961

Cooling Tower and System Maintenance -

Begin With Balance



And balanced maintenance begins with the practical use of quality water maintenance products. Actual field experience shows that an economical, effective level of preventive conditioner, plus annual cleanout, is the realistic air-conditioning

WT-11 and WT-31 Water Conditioners

WT-11 is designed to prevent scale, algae and slime-forming bacteria growth in all cooling towers. One gallon of WT-11 to 250 gallons of recirculating water stops high maintenance costs by adding increased efficiency and longer operating life to cooling systems. WT-11 prevents corrosion of heat exchanger tubes and forms a protective coating of corrosion inhibitor throughout the system. And WT-11 does not evaporate — eliminating the need for continuous addition.

water maintenance answer. . . .

And many service engineers say the best combination of balanced treatment is WT-11 Water Conditioner for seasonal protection and NM-40 for annual cleaning.

WT-31 is formulated for effective prevention of scale formation and corrosion in closed systems. Its peptizing action curbs sludge accumulation and prolongs equipment life. . . . And WT-31 is 100% soluble at all temperatures.

NM-40

NM-40, WT-11's companion, is an economical, ready-to-use product specifically formulated for cleaning scale and other water deposits from interior and exterior lines. NM-40 is quick, ready to go — designed to cut maintenance time. Its built-in wetting agents penetrate fast — and NM-40 needs no neutralizer. NM-40 is there when you need it. It retains its strength year after year and does not deteriorate in storage.

Write for complete information on WT-11 and WT-31 Water Conditioners and NM-40

You Can Rely on

Certified

FORT WORTH

CERTIFIED LABORATORIES

SAN FRANCISCO

NEW ORLEANS

2709 LUDELLE STREET FORT WORTH, TEXAS

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MAY 1961/THE REFRIGERATION & AIR CONDITIONING BUSINESS



Check the Refrigerant at a Glance...

with a **SPORLAN See-All**

*the Moisture and Liquid indicator with the single dot that shows how dry the refrigerant is...
and the full view sight glass that lets you see if the system is fully charged.*

Check these See-All advantages too...

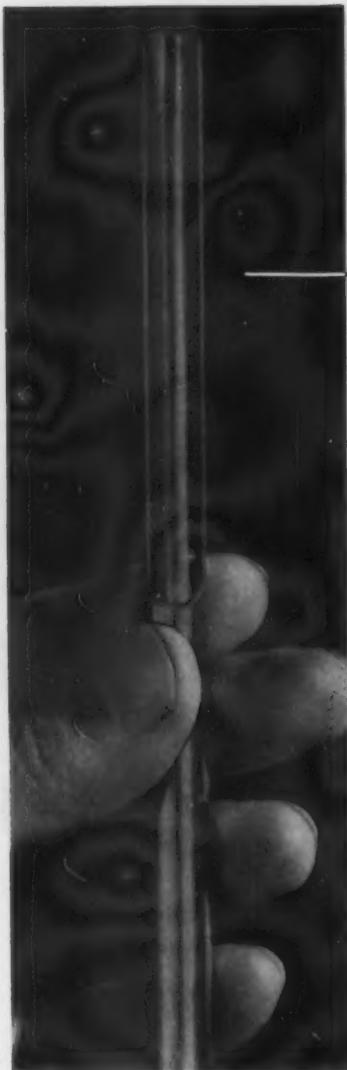
One indicator with the same color change for Refrigerants 12, 22, 40 and 500. Color change points for each refrigerant reliably and accurately calibrated in parts per million of moisture content. Color changes are reversible and easily distinguished...dark green indicates dry, and bright yellow wet. The largest, crystal clear,

full view sight glass. Color indicator protected from discoloration and dirt in the system. Disassembly not required for installation. Double gasket at sight glass assures a positive leakproof joint. Double duty plastic cap keeps dirt and curiosity out. By-pass kits available for economical installation on large liquid lines.

**Get Peak Performance on every installation . . . make
Sporlan See-Alls a must on your next order. See your Sporlan Wholesaler and
ask him to show you the See-All line, or write for bulletin 70-10.**

3/8" and 1 1/8" O.D.
sweat models
now available

SPORLAN VALVE COMPANY
7525 SUSSEX AVENUE ST. LOUIS 17, MISSOURI
Export Department 85 Broad Street, New York 4, New York
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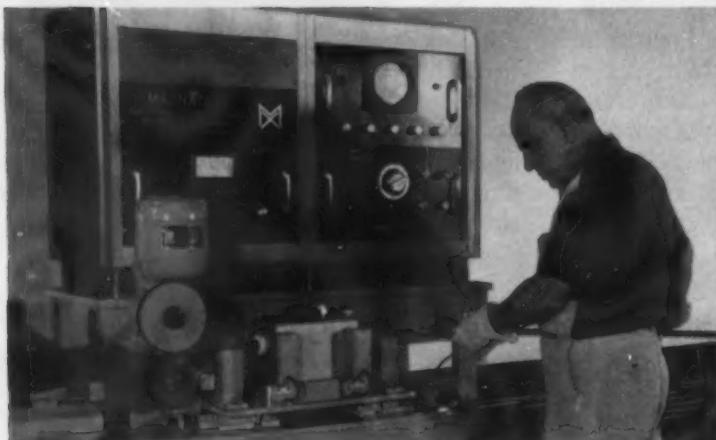
23,000 miles of Anaconda thin-wall copper tube passed by eddy current test— with no customer rejects

To meet rigid requirements for thin-wall copper tube for air conditioners consistently, Anaconda developed new techniques and standards for nondestructive testing that are highly reliable in flaw detection.

Eddy current equipment is Anaconda's inspection tool. It can be operated at many levels of sensitivity. Merely passing tube through this electronic device means nothing. It is only when used at a practical level for each size tube—with meaningful standards—that this type of testing is significant.

Anaconda has developed these critical and realistic standards through some 10 years of research in electronic testing. Substitution of automatic electronic inspection for human observation and judgment means uniformly excellent products for Anaconda customers.

Anaconda standards are based on a practical measure of tube soundness in actual use and end product.



This eddy current testing device, shown inspecting thin-wall tube, detects flaws such as lap seams, embedded chips, cracks, tears and fractures.

circle 12 on reader service card

The eddy current device detects such flaws as lap seams, embedded chips, cracks, tears, and fractures—and rejects unsound tube automatically.

The care and attention Anaconda has devoted to developing electronic testing standards for tube used in air conditioning is typical of quality conscious practices throughout—for all types of copper tube used in air conditioning and refrigeration. It is your assurance of consistent soundness and dimensional accuracy in whatever Anaconda product you buy.

Quality tube and creative technical services. Whether you need hard or soft thin-wall tube, hairpin bends, long coils, capillary or restrictor tube, or one-piece bulb and capillary units, Anaconda has the experience and facilities to produce the quality tube you need for economical manufacture. For creative technical assistance in tube or tubing components, the services of Anaconda Small Tube Division specialists are available to you for the asking. For further information or technical help, write: Anaconda American Brass Company, Box 1031, Waterbury, Connecticut. **ans**

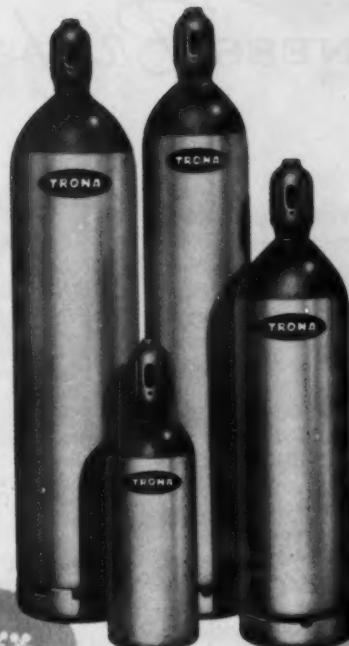
ANACONDA®
COPPER TUBE
for Refrigeration and
Air Conditioning

Anaconda American Brass Company

*service...
quality and
experience in*

REFRIGERANTS

*you can
count on!*



TRONA

The word "TRONA" is written in large, bold, serif capital letters. Each letter is decorated with white snowflakes. The letters are arranged in a staggered, overlapping fashion.

TRONA
distributes Pennsalt's

ISOTRON⁺

Refrigerants in
bulk cylinders and
disposable Charg-A-Can®
containers

ISOTRON-11
ISOTRON-12
ISOTRON-13
ISOTRON-22
ISOTRON-113
ISOTRON-114

Also TRONA METHYL CHLORIDE
& SULFUR DIOXIDE

How do you measure the value of a supplier? . . . efficient service to the trade . . . uniform quality . . . years of experience in supplying the product? Refrigeration wholesalers we do business with say by any standard the answer is contained in the name TRONA—for more than two decades the source of dependable refrigerant products and service. Why does Trona serve you better? You get factory-controlled quality, on-time delivery from key distribution points, and a coast-to-coast organization of trained field representatives who know the wholesaler's marketing needs.

TRONA

American Potash & Chemical Corporation

3000 WEST SIXTH STREET, LOS ANGELES 54, CALIFORNIA

99 PARK AVENUE, NEW YORK 16, NEW YORK

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*TRADEMARK AP&CC

circle 11 on reader service card

THE REFRIGERATION & AIR CONDITIONING BUSINESS/MAY 1961

BUSINESS Briefs

"Industry Week" planned for ARI Show period

Plans for an "Air-Conditioning and Refrigeration Week" were made in March by representatives from industry trade associations and societies. This week would coincide with the 12th National Exposition of the Air-Conditioning, Heating, and Refrigeration Industry, Feb. 12-15, in Los Angeles.

Four groups have already scheduled their national conventions during that week. They are Air-Conditioning and Refrigeration Wholesalers, Refrigeration and Air Conditioning Contractors Association, Refrigeration Service Engineers Society, and Western Air Conditioning Industries Association.

The Western group, hosts for the entire all-industry event, will stage a program of technical sessions featuring speakers on industry-wide subjects.

A special all-industry promotion campaign is being planned to get architects, contractors, builders, service engineers, wholesalers, and other industry groups to the show.

George E. Mills, show director, reports that applications for space are far ahead of previous shows. He expects a sellout on space.

RSES education director John H. Spence dies

John H. Spence became acting educational director of Refrigeration Service Engineers Society in 1957, but stayed with Hussmann Refrigeration, Inc. as national service manager until January, 1960, when he retired to become full-time RSES educational director.

Spence was 66 when he died March 21 at his home in St. Louis, Mo.

He helped develop Hussmann's current field service organization, the factory warranty service, and field liaison with the engineering department.

CALENDAR OF EVENTS

May 21-23, 1961

Northamerican Heating & Airconditioning Wholesalers (Spring Convention)
The Queen Elizabeth Hotel
Montreal, Canada

June 12-16, 1961

Institute of Boiler and Radiator Manufacturers (Annual Meeting)
Seaview Country Club
Absecon, N.J.

June 26-28, 1961

American Society of Heating, Refrigerating, and Air-Conditioning Engineers (Annual Meeting)
Denver Hilton Hotel
Denver, Colo.

February 12-15, 1962

12th Exposition of Air-Conditioning, Heating, and Refrigeration Industry
Great Western Exhibit Center
Los Angeles, Calif.

All LaCrosse directors re-elected at meeting

The five directors of LaCrosse Cooler Co. were re-elected at the firm's annual shareholders' meeting in La Crosse, Wis., in March.

Directors include officers R. S. Denzer, president; W. R. Trapp, vice president, and W. W. Newberry, secretary-treasurer. Others are Q. H. Hale, senior partner of Hale, Skemp, Hanson, Schnurrer & Skemp, La Crosse, and C. S. Werner, general partner of Shearson, Hammill & Co., Chicago, Ill.

In his review of the company's activities, president Denzer highlighted the experimental, as well as development, work carried on by LaCrosse.

Amcoin expands line

Amcoin Corp. is expanding its product line to include ice makers, carbonated drink dispensers, bar dispensing equipment, and related items.

New president is Ernest B. Allison, who replaces Arthur B. Segal, now board chairman.

New Controls product accepted by industry

Creation of an improved constant pressure regulating control paid off for Controls Co. of America since its acceptance by room airconditioning manufacturers.

Controls solved an industry problem with its new control. Previously excessive frosting of evaporator coils on room coolers lowered the unit's operating efficiency. Controls' idea was to develop a control which would maintain constant pressure under varying load conditions.

With this new control to increase the efficiency of room airconditioners, Controls has captured a large chunk of the o.e.m. market despite a higher price.

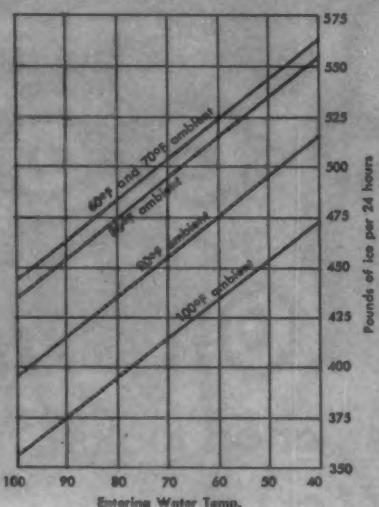
Continued on page 106

what makes
CRYSTAL TIPS ICE MAKERS
 easier to sell?



**22% MORE
 ICE PER DAY!**

MODEL B-500-B — 24 HOUR ICE PRODUCTION CHART



You can give your customers *more* ice per day when you deliver the Model B-500-B Crystal Tips ice maker. Check the ice making capacity chart (left) with that of any other ice maker of similar size and price. When you do, you'll see Crystal Tips is "tops". Crystal Tips is also the winner when you compare space requirements, dependability, serviceability and initial investment costs. All this PLUS bigger distributor profits are mighty BIG reasons why you can make more money selling Crystal Tips ice makers.



**MODEL B-500 Crystal Tips
 2-in-1 Ice Maker. Air and
 water cooled models available.**

This air-cooled Model B-500 is selling better than ever because it makes more ice per day. It also gives your customers a choice of TWO types of ice... large, round, clear ice cubes or tasty, hard, fast cooling ice chips. Write today for complete facts... mail coupon now.

Check this ice making capacity chart with any other ice maker of similar size and price and you'll discover Crystal Tips tops them all.

You can make more money selling
 Crystal Tips ice makers.
 Clip and mail coupon today
 and we'll tell you how...



Crystal Tips

First name in automatic ice makers

**AMERICAN AUTOMATIC ICE MACHINE CO.
 1775 Park Ave. N.W., Faribault, Minnesota**

- I want to know more about Crystal Tips ice makers and their distributor profit opportunities.
- Send literature on Crystal Tips ice makers.

NAME _____

ADDRESS _____

CITY _____ STATE _____

On Display — National Restaurant Show — Visit Booth Numbers 232, 234, 236

circle 10 on reader service card



You get reliability, low cost, good looks with Armstrong Armaflex 22

Armaflex 22 is a foamed plastic pipe insulation that stops condensation on cold lines and saves heat on hot lines to 220° F. An Armaflex job is reliable, low cost, and neat.

Reliable—The proper thickness of Armaflex 22 stops condensation permanently. Its closed cell structure forms a vapor barrier all the way through—requires no finish or jacket indoors.

Low Cost—Armaflex goes on fast—cuts costs and time. All that's required is to apply the covering and seal the joints with Armstrong 520 Adhesive. Fitting covers are quickly made from miter-cut pieces and applied the same way. Many users report savings of 50%, particularly where many fittings are involved.

Neat Appearance—The smooth black surface of Armaflex 22 makes a neat finished job. For a de luxe job, gray or white Armaflex Finish can be brushed on.

Armaflex 22 is one of a complete line of Armaflex products for insulation jobs from below zero to 220° F. Also included are Rigid Armaflex for use at pipe hangers and other places where compression is a problem; Armaflex Sheet for tanks, vessels, large pipes, and fittings; Armaflex Finish for outdoor applications and especially attractive appearance indoors or out; plus the special Armstrong adhesives that insure a neat and reliable job.

The Armaflex Line is available through more than 300 leading wholesalers from coast to coast. For the name of the wholesaler nearest you, and for further information on Armaflex Insulations, write to Armstrong Cork Company, 2205 Roth Avenue, Lancaster, Pennsylvania.

Armstrong INSULATIONS

circle 17 on reader service card

Armaflex 22



Rigid
Armaflex



Sheet
Armaflex



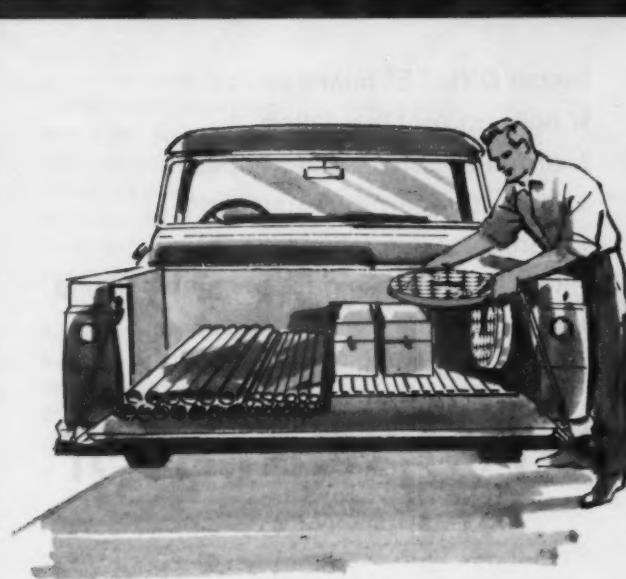
Armaflex
Finish



Armaflex
Adhesives



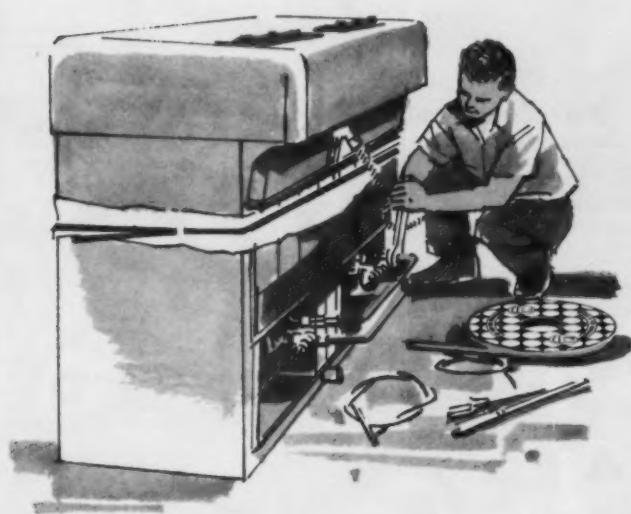
REFRIGERATION SERVICE ENGINEERS!!!



Put Wolverine Roll-O-Tube® on the truck
... USE IT AS A REEL.



Put Wolverine Roll-O-Tube on the job
... IT'S EASY TO HANDLE!



Put Wolverine Roll-O-Tube in service
... IT'S EASY TO USE!



Keep Wolverine Roll-O-Tube on hand and ...

... Buy from your WHOLESALER



WOLVERINE TUBE

DIVISION OF

Calumet & Hecla, Inc.

DEPT. M, 17228 SOUTHFIELD RD., ALLEN PARK, MICHIGAN

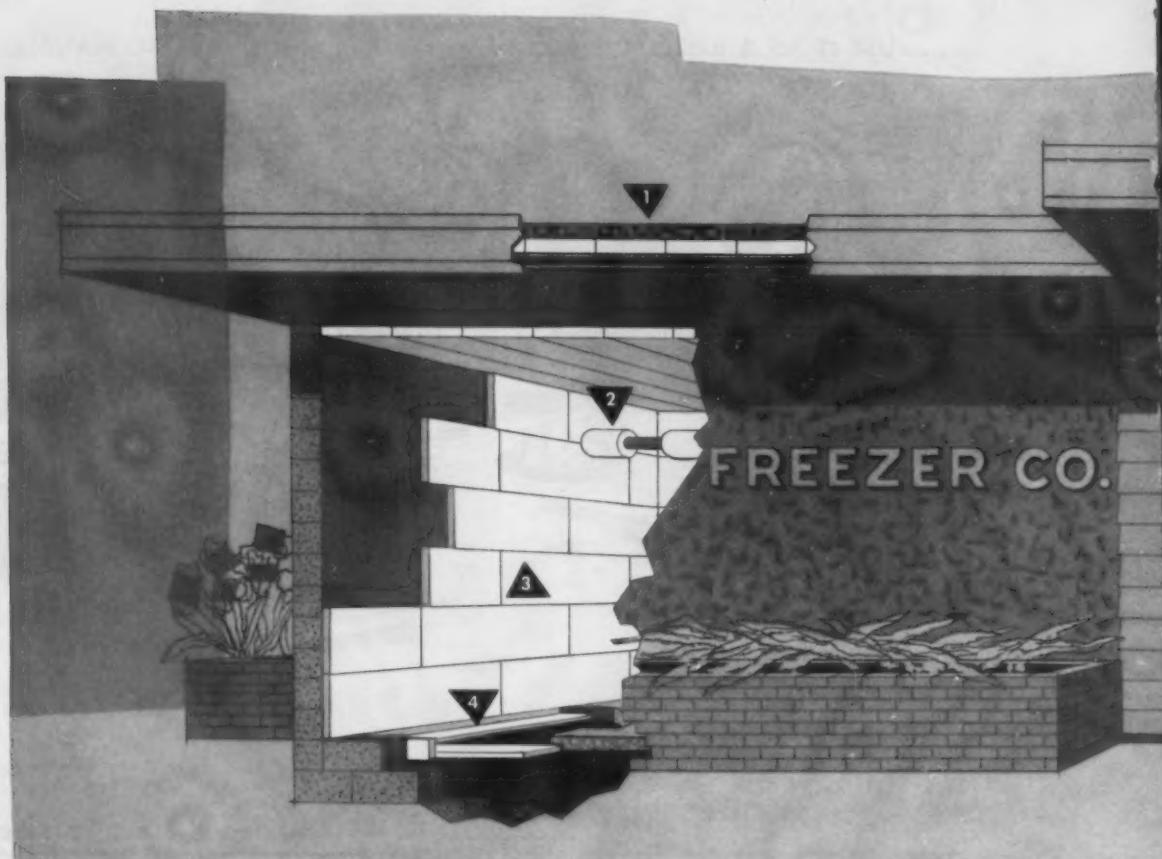
MANUFACTURER IN Copper—Copper-Alloys—Aluminum—Special Metals

PLANTS IN DETROIT, MICHIGAN AND DECATUR, ALABAMA • SALES OFFICES IN PRINCIPAL CITIES
circle 91 on reader service card

How to insulate a building better than a refrigerator

Install DYLITE® board as . . .

1. built-up roof insulation
2. around ducts or water pipes
3. cold storage room insulation
4. perimeter insulation
5. insulation backing for aluminum siding
6. plaster base
7. cavity wall insulation



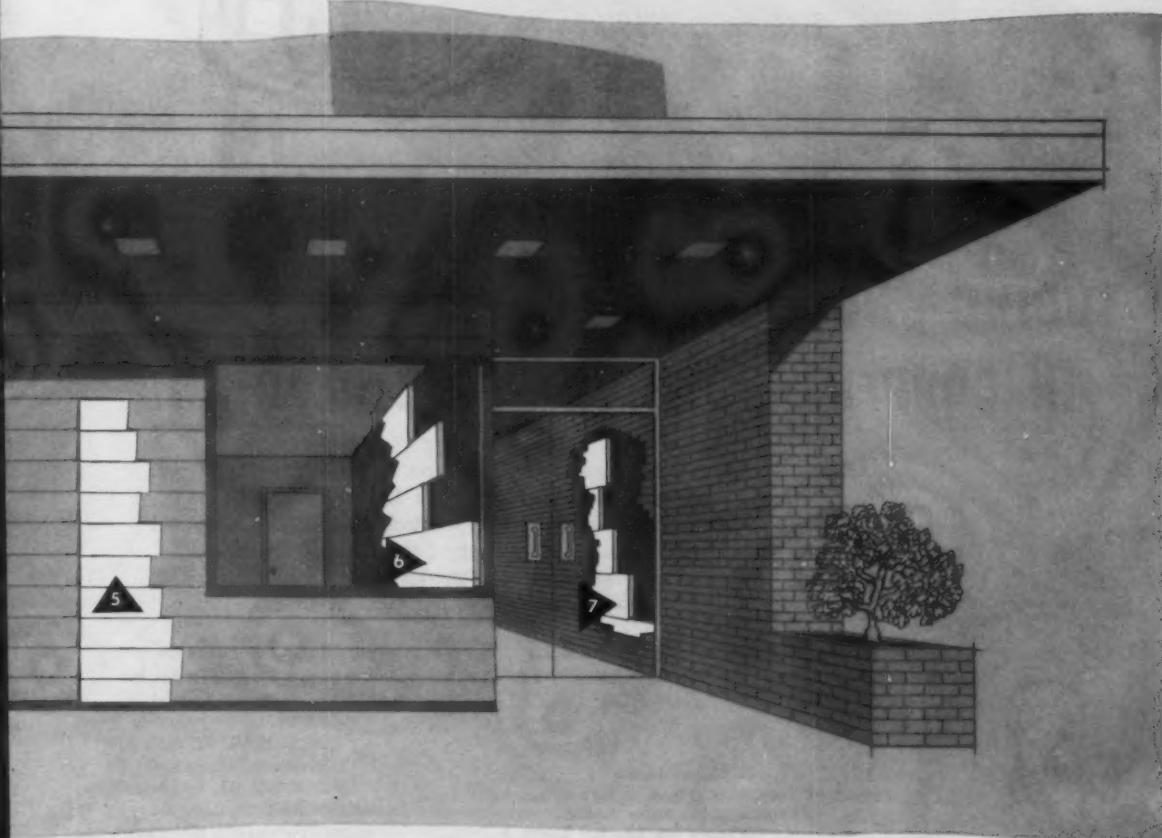
Insulation board made of DYLITE expandable polystyrene offers unsurpassed low-cost, lifetime insulation. It has the lowest "K Factor" of most commonly-used insulating materials. Because this board has a closed cell structure, it is less porous. It has excellent moisture- and vapor-resistance . . . it completely stops "cold wall" sweating in masonry construction above and below the ground.

Board made of DYLITE is strong, not brittle. DYLITE board is rotproof, fungus-proof, verminproof . . . it's ten times lighter than cork. It comes in any length, up to 4' wide, and you can cut, nail, staple, or glue it. It is easily handled, quickly installed . . . saves time for the contractor, money for the owner.

Board manufacturers buy DYLITE in the form of tiny sugar-like beads. When heated, these beads expand as much as 45 times their original size, fuse together and form millions of small cells that trap air and unite in a light, sturdy foam plastic board . . . the best insulating material available.

For more information on insulation board made of DYLITE expandable polystyrene and a list of quality board manufacturers, write Koppers Company, Inc., Plastics Division, Dept. 1522, Pittsburgh 19, Pennsylvania. Koppers also makes these other fine plastics: DYLAN® polyethylene, SUPER DYLAN® high-density polyethylene and DYLENE® polystyrene.

KOPPERS PLASTICS



circle 42 on reader service card

THE REFRIGERATION & AIRCONDITIONING BUSINESS/MAY 1961

You're
Telling
ME...



IN TUBING - NOTHING BEATS COPPER! IN COPPER - NOTHING BEATS READING!

Reading Tube Corporation Specializes in the Making of Copper Tube, Exclusively, Starting in Its Own Refinery and Continuing with Complete Quality Control, thru All the Integrated Processes, to the Packaging of the Finished Product. Complete Stocks at Eleven Strategically Located Distribution Depots Assure Prompt Shipment of Orders.



Always Specify
READING COPPER TUBE

READING TUBE CO. A DIVISION OF PROGRESS MANUFACTURING CO., INC.
EMPIRE STATE BUILDING, NEW YORK 1, N. Y. • PLANT: READING, PA.

Other Divisions of
Progress Manufacturing Co., Inc.

READING METALS REFINING CORP.

Ontelaunee Twp., Berks Co., Pa.

READI-FIN MFG. CO., Inc., Reading, Pa.

MACKENZIE WALTON CORP., Pawtucket, R. I.

READING "LEKTRONIC"® COPPER WATER TUBE •

READING COMMERCIAL BRASS & COPPER TUBE

READING "LEKTROSEAL"® COPPER REFRIGERATION

TUBE • READING RED BRASS & COPPER PIPE •

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DRAINAGE TUBE • READI-FIN® INTEGRAL FINNED

TUBE • SMALL SEAMLESS PRECISION COPPER TUBE.

Sold Through Wholesalers Only

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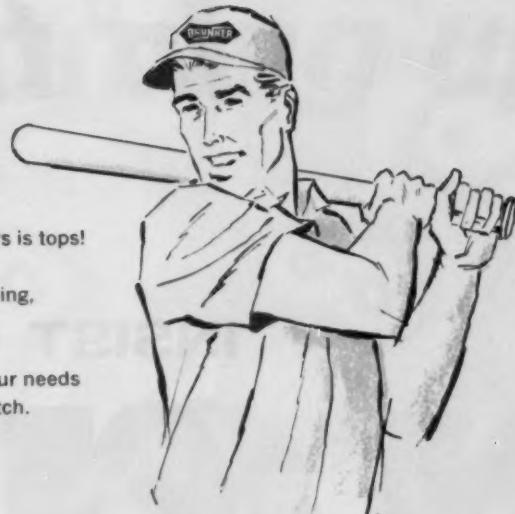
TOP TEAM IN THE LEAGUE...



Yessir! The Brunner team of authorized wholesalers is tops! Check the line-up. You'll find names you know and respect... the real "pros" of the air conditioning, refrigeration and heating league.

Each one has the facilities, the men, the stocks of parts and the sound financial status to serve your needs promptly and properly... and to deliver in the clutch.

Brunner is proud to have them on its team!



ALABAMA
Birmingham—Wittchen Supply Company
Mobile—Refrigeration Supply Company

ARIZONA
Phoenix—Authorized Supply of Arizona Refrigeration Supplies Dist.
Tucson—Authorized Supply of Arizona

ARKANSAS
Little Rock—N. O. Nelson Company

CALIFORNIA
Bakersfield—Refrigeration Supplies Dist.
El Centro—Refrigeration Supplies Dist.
Fresno—California Refrigerator Co.
Los Angeles—Arrow Rice, Inc.
Broz Supply Company
Refrigeration Supplies Dist.

Oakland—William Wurzbach Company
Riverside—Refrigeration Supplies Dist.
San Diego—Refrigeration Supplies Dist.

CONNECTICUT
Hartford—N. W. Day Supply Company
New Haven—Resco, Inc.

DELAWARE
Wilmington—Wilmington Plumbing Supply Co.

DISTRICT OF COLUMBIA
Washington—Refrigeration Supply Company

FLORIDA
Jacksonville—Graves, Inc.
Miami—O'Brian Associates
Orlando—R & R Supply Company
St. Petersburg—Graves Bros
Refrigeration Supplies
Tampa—Lee S. Borsage Company
Noiland Company, Inc.

GEORGIA
Atlanta—Lee S. Borsage Company
Macon—Graves Supply Co. of Macon

IDAHO
Boise—Commercial Distributing Co.

ILLINOIS
Bloomington—Polar Supply Corp.
Chicago—A. Gatz Supply Company
Fred C. Kramer Company
Pearis—Polar Supply Company
Quincy—Polar Supply Corp.

Rockford—Park Distributors, Inc.

INDIANA
Fort Wayne—Central Supply Co.
Indianapolis—Duncan Supply Company
South Bend—Valley Equipment Co.

IOWA
Davenport—White Refrigeration Supply Co.
Des Moines—White Refrigeration Supply Co.

KANSAS
Topeka—Refrigeration Equipment Co.
Wichita—Refrigeration Equipment Co.

LOUISIANA
Baton Rouge—Acme Refrigeration of Baton Rouge, Inc.
New Orleans—Mechanical Supply Shreveport—Standard Brass & Mfg. Co.

MAINE
Portland—A. E. Borden Company, Inc.

MARYLAND
Baltimore—Roche & Hult, Inc.
Hagerstown—Roche & Hult, Inc.
Salisbury—Roche & Hult, Inc.

MASSACHUSETTS
Boston—A. E. Borden Company
Springfield—C. P. Payson Company
Worcester—Standard Supply Company

MICHIGAN
Alpena—J. George Fischer & Sons, Inc.
Detroit—Young Supply Company
Grand Rapids—Heating & Cooling Wholesalers

Jackson—J. George Fischer & Sons, Inc.
Kalamazoo—Heating & Cooling Wholesalers

Lansing—Heating & Cooling Wholesalers

Pontiac—Young Supply Company
Saginaw—J. George Fischer & Sons, Inc.

MINNESOTA
St. Paul—Thermal Company, Inc.

MISSISSIPPI
Jackson—Paine Refrigeration Supply Co.
Tupelo—Paine Supply Corp. of Tupelo

MISSOURI
Kansas City—Refrigeration Equipment Company
Springfield—Thermal Supply Company

MONTANA
Bozeman—Montana Air Cond. Co.

NEBRASKA
Omaha—White Refrigeration Supply, Inc.

NEVADA
Las Vegas—Refrigeration Supplies Dist.

NEW JERSEY
Asbury Park—Wallwork Brothers, Inc.

Camden—Fleck Bros. Co.
Newark—Lucas, Schwab & Katz
Tesco Distributors
Wallwork Brothers

Ocean Grove—Tesco Distributors, Inc.

NEW MEXICO
Albuquerque—Arco Supply Company

NEW YORK
Albany—R. D. Marshall & Co., Inc.

Binghamton—Meier Supply Company
Brooklyn—Excel Refrigeration Supplies, Inc.

Buffalo—Jordan Supply Company, Inc.
Elmira—Brady Supply Corp.
Middletown—Orange County Plbg. Supply

Mount Vernon—Eastern Supply Corp.
New York—Arco Supply Company
Albert Hofeld, Inc.
Reese & Long Refrig. Products

Syracuse—Empire Refrig. Supply Co.
Utica—R. D. Marshall & Company
White Plains—Marco Refrig. Supply Corp.

NORTH CAROLINA
Charlotte—Bowen Refrig. Supplies, Inc.

Greensboro—Hasco, Inc.
Raleigh—H. V. Dick & Company

OHIO
Akron—Davy Sales Company
Cincinnati—Mutual Mfg. & Supply Co.
Cleveland—Cleveland Hermetic & Supply

Columbus—Mason Supply Company
Dayton—A & H Supply Company
Toledo—Kamm Supply Company

OKLAHOMA
Oklahoma City—M & V Supply Co.

Tulsa—Palmer Supply Company

OREGON
Portland—B & W Supply Co.

PENNSYLVANIA
Allentown—Larson Supply Company
Erie—Erie Refrigeration Supplies
Harrisburg—Resco, Inc.
Philadelphia—Acu Supply Company
Pittsburgh—William M. Orr Company
Pennsylvania Ind. Supplies
Reading—Larson Supply Company

RHODE ISLAND
Providence—E. Borden Company,
R. I. Refrigeration Supply Co.

SOUTH CAROLINA
Charleston—Roberts Refrig. Supply Company
Greenville—Graves Refrigeration Supply

SOUTH DAKOTA
Sioux City—Thermal Company, Inc.

TENNESSEE
Knoxville—Leinart Engineering Company

TEXAS
Abilene—Refrigeration Supply & Electric
Austin—Milstead Company
Dallas—Central Engineering & Supply
Dallas—Refrigeration Suppliers, Inc.
Fort Worth—Koldaire Supply Company, Inc.

Houston—Standard Brass & Mfg. Co.
San Angelo—Central Electric Company
San Antonio—Southwest Air Refrig. Supply Co.

UTAH
Salt Lake City—Commercial Distributing Company

VERMONT
Burlington—The Blodgett Supply Company

VIRGINIA
Norfolk—Refrig. Suppliers, Inc.
Richmond—Hajoca Corp.

WASHINGTON
Spokane—Wakefield Supply Company

WEST VIRGINIA
Huntington—Mechanical Refrigeration Supply Co.

WISCONSIN
La Crosse—W. A. Roosevelt Company, Inc.
Milwaukee—Thermal Company, Inc.



BRUNNER DIVISION DUNHAM-BUSH, INC.

WEST HARTFORD 10, CONNECTICUT, U. S. A.

SALES OFFICES LOCATED IN PRINCIPAL CITIES

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In the RUSH

INSIST ON

gen SUPER-DRY

The remarkable dryness and purity of "Genetron" Refrigerants always pay off in dependable, trouble-free performance. That's why "Genetron" Super-Dry Refrigerants are accepted, approved, and *preferred* both for original equipment and replacement charging.

"Genetron" fluorinated hydrocarbon refrigerants are *right*—and they are *ready*. Your "Genetron" wholesaler has them in stock, and is prepared to supply your needs... in a hurry! Ask him, too, to show you the new "Genetron" Kit for field testing hermetic burnouts and the new pressurized "Genetron" 11 solvent cylinders for cleaning mildly contaminated systems after burnout.

months coming up

etron[®]

REFRIGERANTS

genetron 11 CCl_2F ORANGE LABEL
TRICHLOROMONOFLUOROMETHANE

genetron 12 CCl_2F_2 WHITE LABEL
DICHLORODIFLUOROMETHANE

genetron 22 CHClF_2 GREEN LABEL
MONOCHLORODIFLUOROMETHANE

genetron 113 $\text{C}_2\text{Cl}_2\text{F}_3$ PURPLE LABEL
TRICHLOROTRIFLUOROETHANE

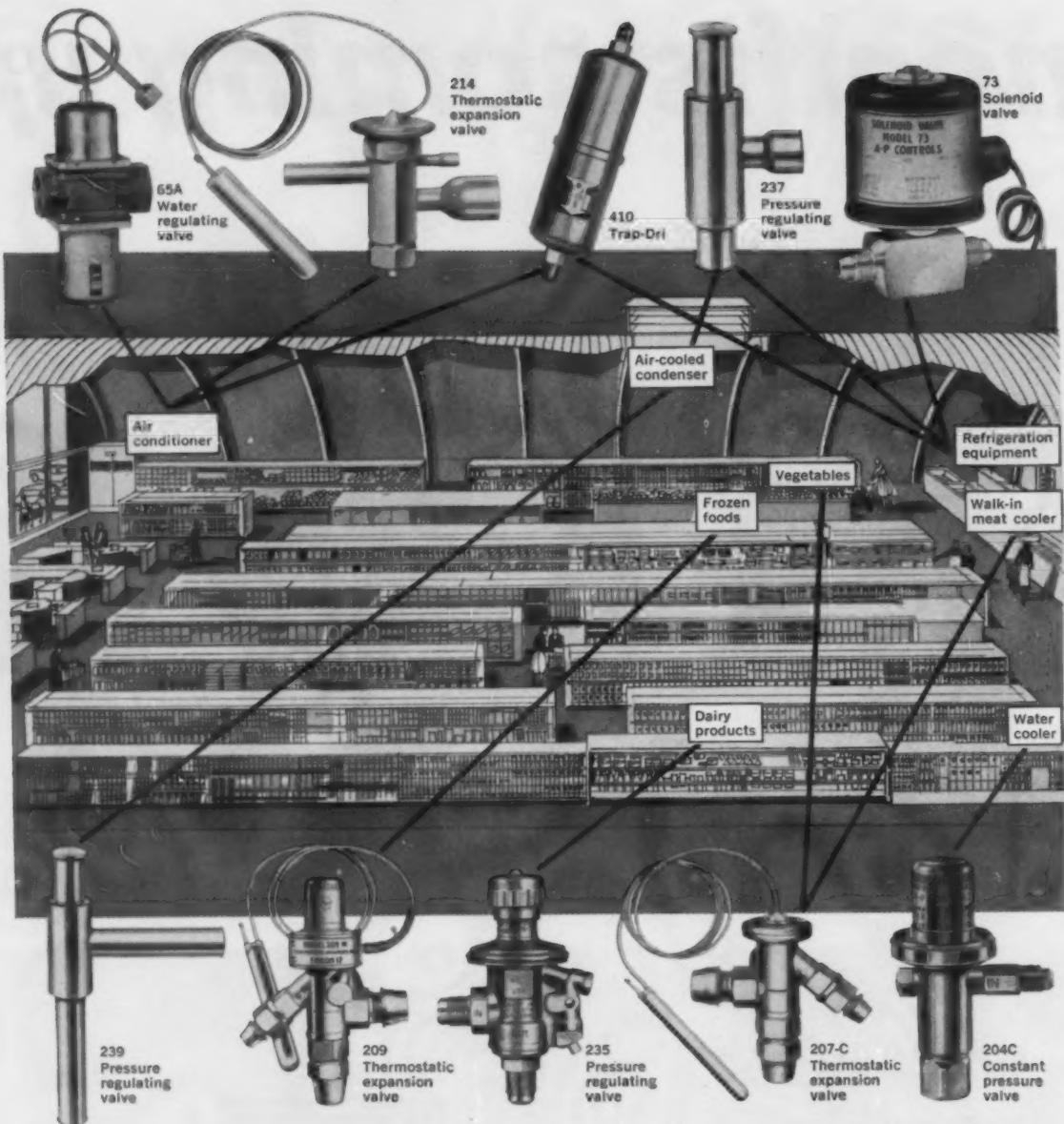
genetron 114 $\text{C}_2\text{Cl}_2\text{F}_4$ BLUE LABEL
DICHLOROTETRAFLUOROETHANE



GENERAL CHEMICAL DIVISION

40 Rector Street, New York 6, N.Y.

circle 8 on reader service card



To cool a cabbage . . . chill a cheese . . . store a steak . . . control the condensers . . . keep shoppers from sweltering . . . shop Controls Company of America first. CC is your best-stocked supermarket for every type, variety, and size of control you need for store equipment. More than 300 wholesalers nearby and ready to supply what you want when you want it.

HAC-38-60

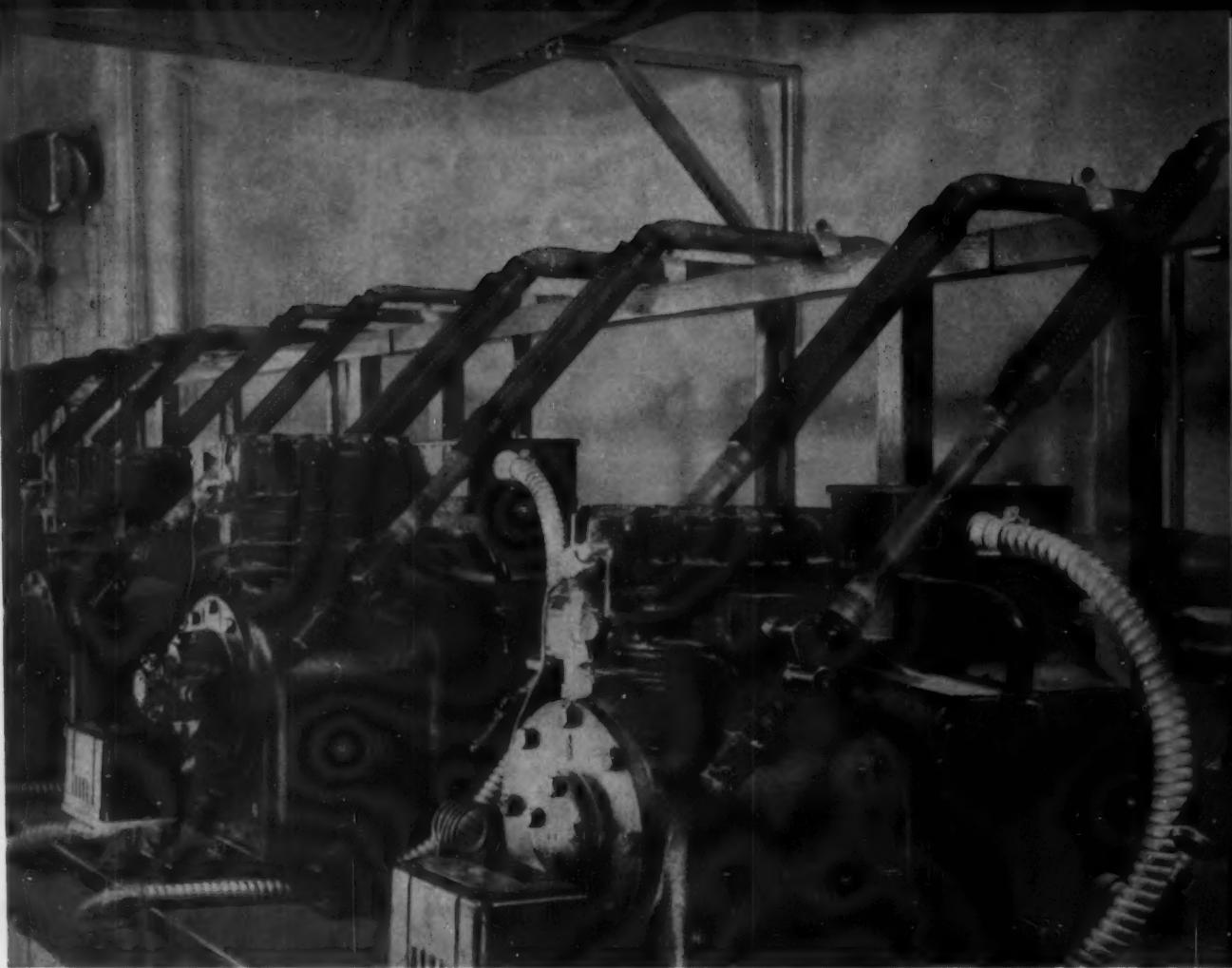
CONTROLS COMPANY **C OF AMERICA**
HEATING AND AIR CONDITIONING DIVISION

2418 N. 32nd Street, Milwaukee 10, Wisconsin • Cooksville, Ontario • Zug, Switzerland
circle 25 on reader service card



Creative controls for industry

MAY 1961/THE REFRIGERATION & AIRCONDITIONING BUSINESS



Anaconda VE's in lines running off service valves of compressor units at the Thriftmart market, Buena Park, Calif.

A TIN BRONZE LINE OF DEFENSE—ANACONDA VE'S HALT REFRIGERATION LOSSES

caused by vibration. In a refrigeration system, piping failure sets off a string of breakdown expenses—loss of refrigerant, food spoilage, and loss of sales. Anaconda VE's help prevent this by damping and absorbing destructive vibration from the refrigeration units. The tin bronze tubing and braiding in Anaconda VE's have the tensile and fatigue strength to control transfer of vibration for millions of cycles. They require no maintenance, and are available in standard lengths and diameters. For a descriptive folder, write: Anaconda Metal Hose, P.O. Box 791, Waterbury 20, Connecticut. In Canada: Anaconda American Brass Ltd., New Toronto, Ontario.



Anaconda Vibration Eliminators are identified on the ferrule—are cleaned inside and out, come to you sealed in polyethylene envelopes, ready for you to install.

THE REFRIGERATION & AIR CONDITIONING BUSINESS/MAY 1961

001551.
ANACONDA VE'S
VIBRATION
ELIMINATORS

circle 13 on reader service card

For

AIR CONDITIONING— HEATING— or GENERAL WATER SERVICE

ONLY Ingersoll-Rand can offer you such a complete line of pumps!

CLOSE-COUPLED LINE OF MOTORPUMPS

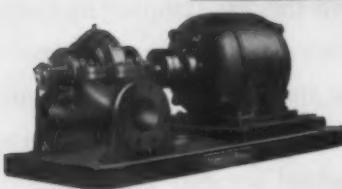
These off-the-shelf Motorpumps are built in sizes from $\frac{1}{3}$ through 25 horsepower to suit any condition to 775 gpm with heads to 190 ft. Advanced engineering and exacting manufacturing have produced these Motorpumps which handle liquids from -30°F to 211°F . Easily hooked up, they are ideal for air conditioning, heating or general water service. They are furnished in screwed connections from $\frac{3}{4}''$ to 3".



The class RV Motorpumps are made as single, two or four stage units available with screwed or flanged connections from 1" to 6". The extra-heavy construction with oversize shaft and bearings assure the maximum in dependability and performance. Built in 1 through 75 hp size these rugged units can deliver up to 3200 gpm . . . heads extend to 650 ft. This Motorpump line is well-suited for large air conditioning installations, heating (to 250°F), boiler feed or general water service.

CLOSE-COUPLED ELECTRIC MOTOR DRIVEN PUMPS

Hydraulically and physically, the pump ends of these units are the same as those used on the close-coupled RV line of Motorpumps. For a given pressure, capacity and shaft speed, impellers and other parts are interchangeable. The cradle construction permits a variation of type of driver that can be removed or replaced without disturbing the pump intake or discharge piping. Sizes $\frac{1}{4}$ through 100 hp to handle liquids of temperatures to 400°F .



Here's a really complete line of single or two stage, double-suction pumps for such service as cooling water circulation in condensers, cooling tower systems, air conditioning equipment, drinking water supply, heating, etc. Built in $1\frac{1}{2}$ through 10 inch discharge sizes, deliveries range to 4000 gpm and heads extend to 1100 ft. Horsepowers range to 400 and liquids can be handled to 400°F .

over a century



of pump progress

from the leading manufacturer . . .

Ingersoll-Rand

79A9 11 Broadway, New York 4, N. Y.

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MAY 1961/THE REFRIGERATION & AIRCONDITIONING BUSINESS

4 WAYS TO PROTECT YOUR SYSTEMS

against Moisture — Acids — Contaminants — Foreign Matter

The Finest Filter-Driers ever developed!

M FILTER-DRIERS



- Maximum drying with **Permasorb®** (WITH MOLECULAR SIEVE)
- Maximum filtering with "MICROWALL"

Exclusive design seals Permasorb desiccant beads inside "Microwall" filter enclosure—keeps contaminants out of desiccant and out of system, for 100% drying and filtering effectiveness. One-piece spun all-brass shell is highly polished and lacquered. All sizes from 1/6 to 10 tons. Check coupon for Bulletin D-5.

3-in-1 Protection! Easy servicing!

DEMOUNTABLE SHELLS and REPLACEABLE CARTRIDGES



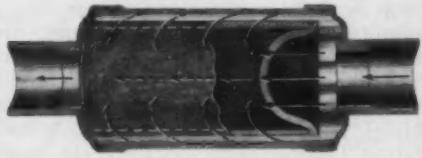
- 1 to 100 tons
- 3 interchangeable cartridges for drying, filtering, straining
- Choice of 5 desiccants



Shells are all-brass, with heavy forged tongue and groove flange and six bronze screws. Filter-drier cartridges available with Super Permasorb, Permasorb, Silica Gel, Activated Alumina or Calcium Chloride. Check coupon for Bulletin D-6.

PREVENT HERMETIC BURNOUTS! Install

PERMACLEAN FILTERS



Keep oil, refrigerant and working parts clean by installing low-cost, high-quality PERMACLEAN Filters in liquid and suction lines. Filter out particles down to 5 microns. All-brass construction. Many sizes up to 20 tons. Check Coupon for Bulletin G-19.

New line of low-priced, UL approved

SILICA GEL DRIERS



Best-made, best-looking driers in their price class. Highly polished and lacquered one-piece spun copper shell, with Davison's PA-400 Silica Gel. Sizes from $\frac{1}{2}$ to $7\frac{1}{2}$ tons. Check coupon for Bulletin DG-27.

Buy these extra-value DFN Driers and Filters at your wholesaler. Attach coupon to letter-head or postcard for bulletins and prices.



THE McINTIRE COMPANY
Livingston, New Jersey



circle 51 on reader service card

FILL IN AND MAIL

The McIntire Company, Livingston, N. J.

Please send free bulletins checked below.

Bulletin D-5
 Bulletin D-6

Bulletin G19
 Bulletin DG-27

Name.....

Company.....

Address.....

City.....

State.....

BUSINESS Trends

HOW OUR BUSINESS IS DOING

SALES IN JANUARY (Bureau of Census) for airconditioning and commercial refrigeration equipment distributors, contractors, and wholesalers:

DOWN 12% from a year ago

DOWN 2% from previous month

INVENTORIES IN JANUARY (Bureau of Census) for airconditioning and commercial refrigeration equipment distributors, contractors, and wholesalers:

UP 19% from a year ago

UP 1% from previous month

CURRENT LIABILITIES IN FEBRUARY for business failures of 2 airconditioning contractors totaled \$44,000 (Dun & Bradstreet). Compare this to:

3 failures with \$532,000 liabilities a year ago

5 failures with \$119,000 liabilities in January

GENERAL BUSINESS INDICATORS

	Latest Period	Previous Period	% Change
Housing Starts (thousands)			
Month ending 2/28/61	77.7	70.6	Up 10.1
New Construction, put in place (\$ billions)			
Month ending 2/28/61	3.6	3.8	Down 5.3
Unemployment (% of labor force)			
Month ending 2/28/61	6.8	6.6	Up 3.0
Manufacturers' Inventories (\$ billions)			
Month ending 1/31/61	53.5	53.6	Down 0.2
Manufacturers' Unfilled Orders (\$ billions)			
Month ending 1/31/61	45.2	45.4	Down 0.4
Retail Sales (\$ billions)			
Month ending 2/28/61	15.1	15.7	Down 3.8
Personal Saving (\$ billions)			
Quarter ending 12/30/60	27.2	29.2	Down 6.8
Disposable Personal Income (\$ billions)			
Quarter ending 12/30/60	358.1	357.5	Up 0.2
Gross National Product (\$ billions)			
Quarter ending 12/30/60	503.5	503.5	No Change
Industrial Production Index (1957 = 100)			
Month ending 2/28/61	103	102	Up 0.9

Source: U.S. Dept. of Commerce

Industry leaders see 1961 as growth year for cooling

1961 should be the biggest year in the history of airconditioning. That's the opinion of industry leaders attending the recent 15th International Heating & Air Conditioning Exposition in Chicago, Ill.

"Airconditioning is bound to be a growth industry, regardless of what happens to the economy," says Frank J. Nunlist, executive vice president of Worthington Corp.

"Whether home building is up or down, there will be a higher percentage of new airconditioned homes. We can look for a 15-20% annual growth in central residential airconditioners and package systems, depending on the rate of home construction."

Russell Gray, president of Carrier Air Conditioning Co., attributes the 10% rise in central airconditioning of residences last year to the increasing number of builders who figured cooling as a plus factor in improving their sales. "The same factors make the outlook for '61 somewhat optimistic," added Gray.

Both men anticipate an active commercial airconditioning field this year. Nunlist cites government contracts as aiding growth, while Gray points to industry-wide gains in the sale of engineered or applied cooling installations.

These statements are based on predicted increases of 5% in non-residential construction for the year; 10% in office building, and 11% in hotel construction.

Other growth factors include a sharp expansion of airconditioning of educational facilities (expected 10% upturn) and in central airconditioning of apartment buildings. There's also a heavy demand established in industrial, hospital, and shopping center markets.

The replacement market looms for the first time as a factor in airconditioning sales. In addition to replacing worn out units, it's often more economical to install a new, larger unit than to add to existing equipment.

Refrigeration also has a promising outlook. York Div., Borg-Warner Corp. anticipates a 20% increase in 1961 in its industrial and commercial refrigeration business.

Why? Because of gains in the frozen food field and in the use of refrigeration in supermarkets and in industry. Some industries using refrigeration for processing include plastics, chemicals, and steel.

At the moment, manufacturers see little competition from abroad. In fact, most are moving into foreign markets and finding them profitable.

For latest ARI figures on
unitary airconditioner shipments
turn to page 74

"PLUS FEATURES HELP SELL THE ALL NEW . . ."



Model CH-550 CHIPPER



FOR CHIPS

Model CH 550
550 lbs. daily
"chip harvest"
500 lbs. bin
storage capacity
Model CH 250
250 lbs. daily
"chip harvest"
300 lbs. bin
storage capacity



FOR CUBES

Model CU 200
200 lbs. daily
"cube harvest"
250 lbs. bin
storage capacity
Model CH 400
400 lbs. daily
"cube harvest"
450 lbs. bin
storage capacity

● Produce diamond-bright ice chips and clear, solid cubes — shaped as a cube should be. (Cubes last longer — displace more liquid)

● Store MORE than a full day's ice production, yet take a modest amount of floor space. (You get all the ice you need even at "peak-usage periods".)

● Handsome cabinetry is suitable for use in dining or other customer areas. Five non-fading fiberglass colors make it easy to match with existing decor. Rugged yet lightweight fiberglass cabinetry can't rust or corrode — lasts a lifetime. Both interiors and exteriors have contoured corner-less edges.

● Quiet operation and minimum maintenance. Improved and simplified design means fewer operating parts. (Refrigeration components are manufactured by the recognized leaders of the industry). Easy to operate.

● Easy-access front panel completely exposes mechanical compartment and principal components for servicing. Easy to install. Ice maker is installed on top of matching storage bin. Insulating Inert Foam between walls of cabinet locks in sound and temperature. Heavy-duty compressor. Water or air-cooled condenser. F12 refrigerant.

WE INVITE COMPARISON — dollar for dollar and feature for feature. The new Kodiak line is ahead in design — easy to sell, easy to install and easy to maintain. Distributorships in some areas are still available. For complete information without obligation, write:

KODIAK, INC.

Telephone: CA 7-8354

297 COMMERCIAL STREET ST. PAUL 6, MINNESOTA



Clip out and mail today

KODIAK, INC., 297 Commercial Street, St. Paul 6, Minnesota

Please send me complete details about Kodiak.

Name _____

Company _____

City _____ State _____

Type of Business _____

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THE REFRIGERATION & AIR CONDITIONING BUSINESS/MAY 1961



LOAD AND BEHOLD! Loading's a breeze with the VW Panel's big 47 by 46-inch double side doors. Loads of room, too. Floor

space is 43.1 square feet—170 cubic feet. Every inch usable. And the VW Panel Truck accommodates 1,830 pounds of cargo!

Illinois refrigeration and heating

VW Panel Truck goes 11,000 miles for 1.48¢ per mile!

Leo Wasniewski, owner of the Roberts Refrigeration and Heating Co., Evergreen, Illinois, is really sold on Volkswagen. Let him tell you why:

"My Volkswagen Panel Truck has about everything. Easy handling, easy loading. Lots of capacity—and that's a must in my business. Plenty of advertising value. I get calls all the time from people

	VW PANEL	TRUCK #2	TRUCK #3
Total cost of gas	\$152.48	\$227.77	\$265.73
Total gallons used	478	714	833
Total service and maintenance costs	\$10.00	\$200.00	\$200.00
Mileage per year	11,000	10,000	10,000



ATTENTION GETTER. Mr. Wasniewski takes advantage of the VW's 106 square feet of outside display space to advertise his business. It has helped him get new customers. Incidentally, note

the ladder rack Mr. Wasniewski has added, a modification he couldn't do without. Inside and out, the VW is all utility and always ready to do an honest day's work.

company goes for Volkswagen economy

who've seen my Volkswagen Panel around town.

"What I go for most, though, is Volkswagen economy. I own two other trucks, but my VW outperforms them *and* gives me 23 m.p.g. Look at my figures for last year and you'll see why I'm enthusiastic."

No wonder he's enthusiastic. And he's not alone. There are now over 110,000 VW Trucks in the U.S. Volkswagen is the advanced truck idea that's been proven on the road for the past 11 years.

Are you ready for a VW Truck? You are if you

want a truck that costs less to buy, less to operate, and less to service. The suggested retail price for the VW Panel Truck (East Coast Port of Entry) is \$1,895 (West Coast, \$2,015). To help you make the right decision, talk to your Authorized Volkswagen Dealer soon. Ask for a demonstration. And get your free copy of the 60-page illustrated booklet—"The Owner's Viewpoint." It documents with facts and figures VW Truck performance and owner experience in a wide variety of businesses.

circle 92 on reader service card



New designs!

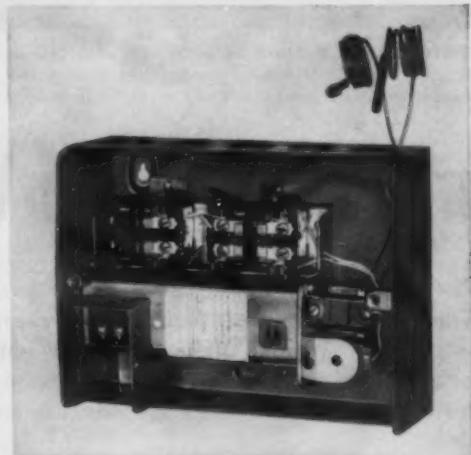
**Honeywell now offers a
complete selection of panels
for 2 to 7 $\frac{1}{2}$ ton
air conditioning systems!**

You get the latest improvements in panel design, planned to meet your equipment needs, yet avoid costly engineering and production problems. You cut down on installation time and profit-losing service call-backs because all components and electrical circuits have been standardized and simplified. You

simplify ordering, stocking and inventory with single-source responsibility. And you sell *the most complete line* backed by the best name in the business. Call your nearby Honeywell office for details. Or write Honeywell, Dept. RS-5-82, Minneapolis 8, Minn. In Canada, write Honeywell Controls, Limited, Toronto 17, Ont.

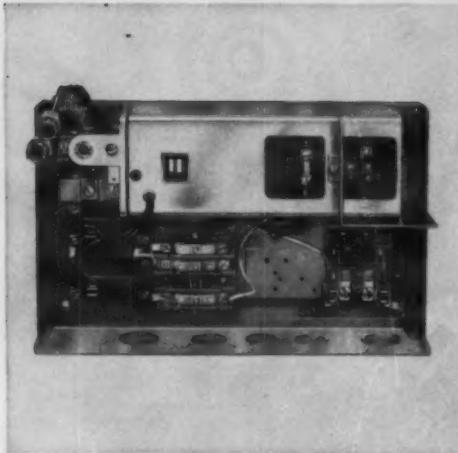


PROVED R8100 series panels incorporate all components necessary to control 2 and 3 ton air conditioning systems in one compact unit! The transformer, a single or two-speed fan relay and an 18 or 25 amp contactor are all mounted on a single subpanel. Models are available with time delay, remote reset,



and heat pump changeover relays. The same panel can be used for self-contained and split systems. Manufacturers can mount and pre-wire the system at the factory, simplifying dealer and distributor inventory and easing replacement problems. With the indoor fan-center panel eliminated, installation time is cut.

Proved performance!



NEW R8200 series panels for 4, 5 and 7½ ton systems combine proven features of the R8100 series with new improvements! These new all-in-one control panels for self contained or remote air conditioning units and heat pumps include UL approveable rainproof enclosures for both the control center and

high side panels. Provisions are made for the easy addition of auto-recycling overloads—used with remote reset impedance relay systems. New Class 1 terminals, for tying in a 24 or line voltage compressor protection system, are standard. And models are available with a 14 ampere, 120 volt fan relay rating.

Honeywell



First in Control

SINCE 1885

HONEYWELL INTERNATIONAL
Sales and service offices in all principal cities of
the world. Manufacturing in the United States,
United Kingdom, Canada, Netherlands, Ger-
many, France, Japan.

Select from Honeywell's complete line of heating-cooling thermostats



New T87 Honeywell Round—the world's most popular heating-cooling thermostat.



New T870 Deluxe Thermostat controls single or two-stage heating-cooling systems.



New Weather Station® Control Panel assures the ultimate in heating and cooling comfort.



New Y379C Indoor-Outdoor Heating Cooling Control System provides an early warning of changing outdoor weather conditions and automatically adjusts the indoor thermostat to compensate for it.

*Trademark

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THE REFRIGERATION & AIRCONDITIONING BUSINESS/MAY 1961



Don't blindfold him!

THE MAN in this picture is a cancer research scientist. The device he is using looks like something out of science fiction—but actually, it's an electron microscope. It shows the sub-microscopic detail of a cancer cell—magnified 100,000 times. *The cost of one electron microscope is \$35,000.*

Some of the equipment needed for cancer research is even more expensive.

Today, in research centers throughout the country, 1300 scientists, supported by American Cancer Society funds, are at work searching for the cause of cancer—and, ultimately, ways to prevent it.

The American Cancer Society grants millions of dollars for research on such projects as the study of viruses as a possible cause of cancer—the development of hormone treatments for cancer—the control of cancer by drugs. *Life-and-death projects.*

Your help is needed to enable the American Cancer Society to continue this support.

Don't blindfold cancer research. Give to it. Send your contribution now, to CANCER, c/o your local post office. All gifts are tax-deductible.

AMERICAN CANCER SOCIETY





REFRIGERATION BULLETIN

"Helpful facts
for the serviceman"

ANSWERS TO FIELD CHARGING PROBLEMS

CAN-O-GAS®—INDUSTRY'S WIDEST CHOICE OF REFRIGERANTS AND CHARGE SIZES

Can-O-Gas provides a reliable and convenient method for adding regular or critical charges of refrigerants in the field. No heavy cylinders or metering devices to lug along, no deposits on cylinders. Can-O-Gas comes in small, compact cans you can use and discard.

The Can-O-Gas method introduces a wide choice of refrigerants in preweighed charges of a few ounces to several pounds.

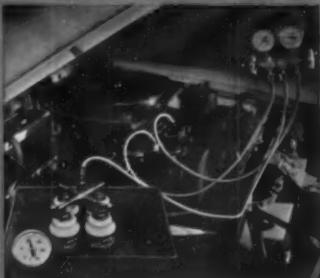
SPECIFIC ADVANTAGES OF CAN-O-GAS

- Charging or recharging can be done accurately away from the shop
- Contamination by moisture and noncondensable gases is avoided
- Vapor pressures for gas phase charging can be easily maintained by warm water immersion
- Simultaneous opening and dispensing of 2, 3 and 4 cans of refrigerant provides preweighed charges of 30, 45, 60 oz. or combinations thereof

CALIBRATING DEVICES ELIMINATED

The Can-O-Gas handy field-charging method makes possible addition of pre-weighed regular charges or of fractional charges without need for scales or other devices. With the use of Multi-Openers, it is possible to deliver charges from 15 to 60 oz. in increments of $\frac{1}{2}$ oz.—with an accuracy of ± 4 grams.

PRINCIPAL USES OF CAN-O-GAS



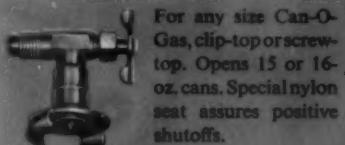
Can-O-Gas has been widely accepted by service and maintenance men for in-the-field charging of water and beverage coolers, freezer cabinets, and auto air-conditioning systems. They can rely on Can-O-Gas for maximum controlled purity and for greatest accuracy without cumbersome containers and measuring devices. There is no easier way to add critical charges of refrigerants in the field in either the gas or liquid phase.

MULTI-OPENER

Dispenses contents of a single can or up to four cans one by one or simultaneously for fractional charging.



SINGLE CAN VALVE OPENER



For any size Can-O-Gas, clip-top or screw-top. Opens 15 or 16-oz. cans. Special nylon seat assures positive shutoffs.

HOW SUPPLIED



Freon-12* is supplied in 15-oz. cans and a wide variety of preweighed charges. Freon-114* and sulfur dioxide are supplied in 1-lb. cans; Freon-22* in the new 1-lb. and 2-lb. aluminum disposable cans; and methyl chloride in 2-lb. steel cylinders. All Can-O-Gas products are available in screw-top or clip-top closures.

"Virginia" is the only national sales agent and authorized repacker for Du Pont's Freon* refrigerants. They are supplied in all popular sizes.

*Du Pont registered trademark

See back page for full line of refrigeration products

**FOR TROUBLE-FREE
MAINTENANCE USE**



"Virginia" Scale & Corrosion Inhibitor
Reduces scale buildup sharply, keeping
scale-forming solids in suspension or solution.
Less scale, less labor, lower maintenance costs.

"VIRGINIA" REFRIGERATION PRODUCTS



"Virginia" Liquid Scale Remover

Ideal for heavy scale. Dissolves 3 lb. of scale per gal. Works fast. Inhibited to prevent metal damage. (Anti-foam agent and test papers included with every container.) Light shatterproof throwaway container for easy handling and easy pouring.



"Virginia" Solid Scale Remover

Highly inhibited—safe for use on galvanized, dipped zinc and aluminum water-cooled equipment. Destroys algal growth. Contains 96% sulfamic acid.



"Virginia" Algae-Cides

Adaptable to the special use requirements in (1) towers, (2) evaps, (3) air washers, and (4) ice machines and drip pans. A new No. 4 high-potency formula kills the tough resistant types of algae.



Prostite Insulation

Tape—ideal for stopping pipe drip. Adheres to any dry surface. **Permagum** slugs—seals seams, copper tube, BX and conduit entries against moisture. **Cords**—nonstaining, odorless, shaped for use on display cases, freezers, room coolers, etc.



Du Pont FREON® Refrigerants

Nonflammable, nontoxic, stable, odorless
Best known for premium quality. Most widely used refrigerants in the industry. "Virginia" is the only national sales agent for Du Pont "Freon". F-11,* F-12,* F-13,* F-22,* F-113* and F-114* are available in cylinders of all popular sizes.

*Du Pont registered trade mark



"Virginia" Ice Machine Cleaner

Eliminates slow freezing, bad taste and odor. Will not injure enamel or polished metal surfaces. Highly effective on automatic cube or flake ice machines.



Vascocel Insulation

Preformed of soft, durable, clean, odorless Neoprene. Cuts time and labor costs sharply. Closed-cell structure makes condensation impossible. Ozone, oil, acid, and fungus resistant. Application temperature range 0-220°F. Available in $\frac{3}{8}$, $\frac{1}{2}$ and $\frac{3}{4}$ wall thickness.



"Virginia" Degreasing Solvent

No. 10 has low toxicity, is noncorrosive and fast drying. High flashpoint of 154-160°F reduces fire hazard; dielectric strength 20,000 volts.

Ask about "Virginia" "Freon 11" Cleaning Solvent for motor burnouts.



"Suniso" Refrigeration Oils

G Oils are improved for greater stability and lower waxing point. Available in 3G-150 SSU, 4G-300 SSU, and 5G-500 SSU. Dual Inhibited oils have same low wax point, resist breakdown and copper-plating even more effectively.



Can-O-Gas® Packaged Refrigerants

Throwaway cans—full line in screw-top or clip-top cans. Wide variety of pre-weighed charges, accurate to ± 4 grams. Selection of Freon® gases, sulfur dioxide, and methyl chloride.

Carried by wholesalers everywhere. Order from one nearest you or contact Refrigeration Division, VIRGINIA SMELTING COMPANY, West Norfolk, Va.

Available in Canada and many other countries

"Virginia" is the only national sales agent and authorized repacker for Du Pont's "Freon" Refrigerants.

LET'S TALK *Business*

An open letter to contractors

WHO ARE YOU?

Does this sound like the name of a new TV mystery program? It isn't a TV show, nor should it be a mystery. But often it is. Granted, you have a place of business — often quite a substantial one. That's something concrete — stone, wood, glass, people.

But what you are and what your image is can only be determined by your influence on the sales of this industry.

Unfortunately, many manufacturers in this industry don't really know what you are. They have only a hazy image of what you do or what you are capable of doing. Why? Because of the manufacturer's limited interest in his own product range.

What do you represent to the manufacturer? You are an outlet for commercial, residential, and industrial products in the airconditioning and refrigeration field. Few manufacturers have the same image of your operation.

Most manufacturers of airconditioning equipment do not believe your work carries you into the refrigeration or air handling field. Most manufacturers of refrigeration equipment don't think you go into airconditioning or air handling. And, few manufacturers of air handling equipment believe you get into refrigeration or airconditioning.

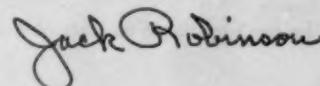
All of these manufacturers fail to realize that:

- You are the determining influence in what product is sold in 69% of all commercial and industrial installations.
- You are solely responsible for buying 47% of all products sold for such work when you negotiate with individual owners.
- You change the product from the one specified to an equal or better in 47% of all plan-and-spec jobs.
- You do much of the layout for and counseling of consulting engineers and architects, often receiving nothing for your services.
- You alone are responsible for the product choice in all residential applications.

Yet, with all of these things that we both know you do, you are the ones showing the most unsatisfactory profit.

How do you go about changing this? You should:

- (1) Become active in your local contractor association.
- (2) Take your problems to your wholesaler and ask him for help. Don't just change wholesalers.
- (3) Support licensing codes in your area.
- (4) Develop a greater brand loyalty. It will really put dollars in your pocket, believe me!
- (5) And — above all — don't take any job that won't leave you with a profit.



**Cooling load
look like
this?**

ICE BANK AIRCONDITIONING

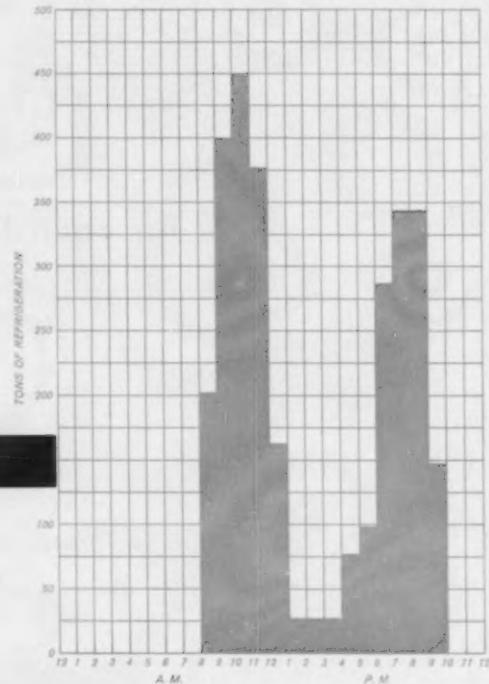
**can be
the answer**

A STORAGE BATTERY OF COOLING — that's the simplest way to describe the ice bank system of airconditioning.

It stores up cooling capacity when airconditioning is not needed, then delivers it when it is needed. So the ice bank system is tailor-made for any application that requires high peak airconditioning capacity for relatively short periods of time at intermittent intervals.

It's an engineered type system which is a natural for the qualified airconditioning contractor to sell and install. And it can be a real money saver for the customer.

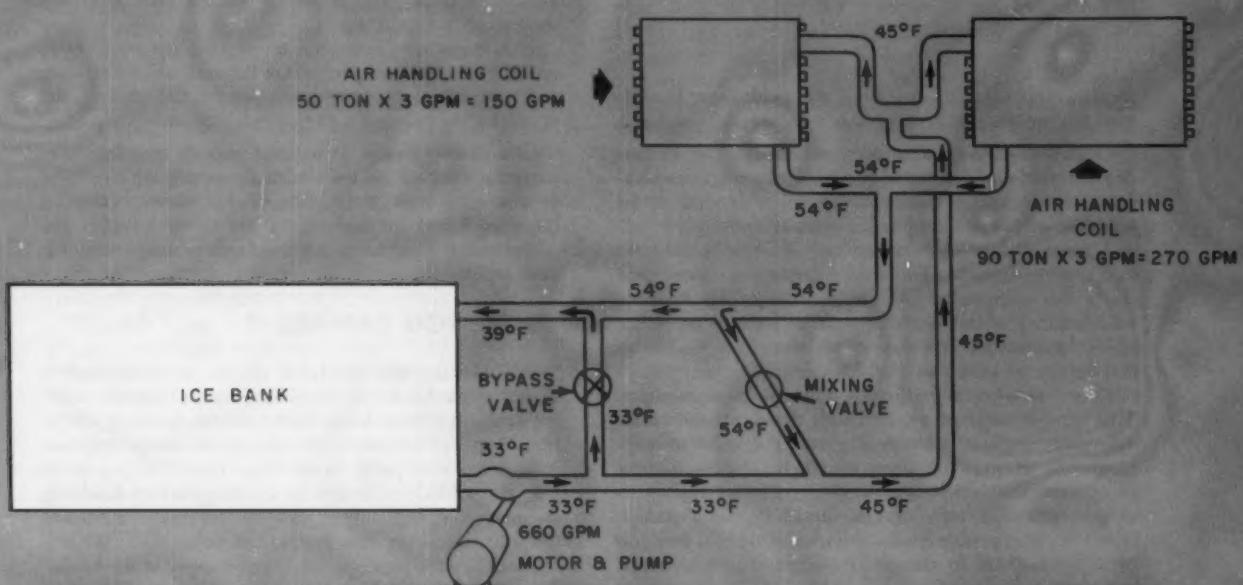
The ice bank itself consists of a series of refrigeration coils, usually of the plate type, immersed in water in an insulated tank. A compressor hooked up to these coils in a conventional refrigeration cycle makes ice build up on the coil surfaces.



When the airconditioning system calls for cooling, a pump circulates the chilled water in the tank over the ice bank and then through pipes to the finned coils in the air handling units. After picking up the heat from the air, the water returns to the tank to be rechilled and recirculated as needed.

You can buy complete factory-built ice bank units ready to install, particularly in the smaller sizes, or you can build up a system from scratch on the job. Because it combines a conventional refrigeration cycle with a regular chilled water airconditioning circuit, the ice bank system involves all the components of both — condensing units, coils (both for ice bank and air handling), pumps, motors, valves, controls, pipe and fittings, and often cooling towers or other water conservation devices.

Any time you're called on to figure an airconditioning job that needs high peak capacity for short periods, seriously consider using the ice bank system. It offers many advantages, and it may help you make a sale by showing your prospect that you can handle his job with smaller equipment at less cost than your competitors bidding conventional equipment.



THIS PIPING LAYOUT for a typical ice bank airconditioning system shows the water temperature in the discharge and return water lines.

the location of the tempering or mixing valve, and the manner of bypassing the excess gpm to promote agitation in the ice bank tank.

WHAT IT'S MADE OF

The ice bank itself has five basic components: evaporator, tank, compressor, controls, and circulating pump.

Evaporator. It usually consists of plate-type coils but it may also be bare tubing or pipe coils so fabricated and supported that ice builds up evenly on them. The plates are arranged so the best water circulation is obtained. Baffles make the water flow evenly across the ice.

Every evaporator needs some kind of refrigerant metering device. A few flooded systems have been installed, but direct expansion is generally preferred. Multi-outlet valves, or valves used with pressure-type distributors, are satisfactory if the coils are far enough apart to tolerate an uneven ice buildup. An individual expansion valve should be provided for each of the coils if they must be set close together because of limited space in the tank.

Tank. You can get factory-built tanks, complete with coils, in many sizes. In many cases, though, because of the size of the tank or because of the location, it's advisable to build the tank on the job site. It can be made of welded steel plate or reinforced waterproof concrete. Space the individual cold plates

on the proper centers to give maximum ice thickness within the limits of space and available buildup time.

One example of a tank built in the field is one in a large church with a peak cooling capacity of 440 tons. It measures 24 x 40 x 7½ and is insulated with 2" cork board on the bottom and 4" cork board on the sides. It isn't insulated on the top because the tank is in a separate basement area and there isn't any air movement above the tank. No evaporation takes place when the dewpoint temperature of the air above the tank equals the water temperature. This tank can make 80 tons of ice an hour, or 1920 ton-hours of refrigeration a day. It has a normal water level of 6'.

Compressor. Size the compressor according to the buildup and recovery needs. The church job just described used two 50-hp and two 25-hp compressors. Each is a separate refrigeration system that can operate independently of the others. It takes about 21 hours to build 4" of ice on all of the plates from a water temperature of 30 F and about 26 hours from a water temperature of 48 F.

At 20 degrees suction pressure, you can obtain only .8 ton per horsepower. A rule of thumb method of determining compressor capacity for any ice bank

Continued on page 38

ICE BANK AIRCONDITIONING

application: take 25 or 33% of the peak hour load to get the necessary horsepower compressor required.

Controls. Because the system involves the storing of refrigeration built up in the form of ice on evaporator surfaces, an ice thickness control is needed to determine when the compressor should operate.

A flow of current between two electrodes actuates one type of control. The water closes the circuit and starts the compressor. When the electrodes become encased in ice, the circuit opens and the compressor stops, because ice is a poor conductor. The electrodes can be set to give any ice thickness.

There is also a bulb-type ice thickness control. This type is satisfactory, although three or four cycles may be necessary before it gives a consistent performance. It may be used either in a pilot circuit to control the compressor through the starter or to close a solenoid valve in the liquid line if a pump-down cycle is preferred. In the second case, a lowside pressure control in the pilot circuit starts or stops the compressor.

On the air handling side, a wall-mounted thermostat controls room temperature by regulating the fan on the air handling unit. In multizone applications, a thermostat in each zone controls the operation of a face and bypass damper which lets air go through the coil or be forced around it, as needed. When any zone calls for cooling, both the air handling fan and the circulating pump start. If the same pump also serves other air handlers, water circulates through the coils in the other zones, but the fans in these zones will not operate until their thermostats call for cooling.

If the fan on the air handling unit draws in or circulates fresh air, you should provide a manual switch as well as a thermostat.

It is sometimes desirable to connect the compressor controls to the pump controls through relays so they will cut off the compressors when the pumps are operating to prevent a high peak demand.

Circulating pump. It assures proper circulation of water in the tank so ice builds up evenly on the coils. It also circulates the chilled water through the air handling units in the system. Select and install the pump according to recognized plumbing standards and practices.

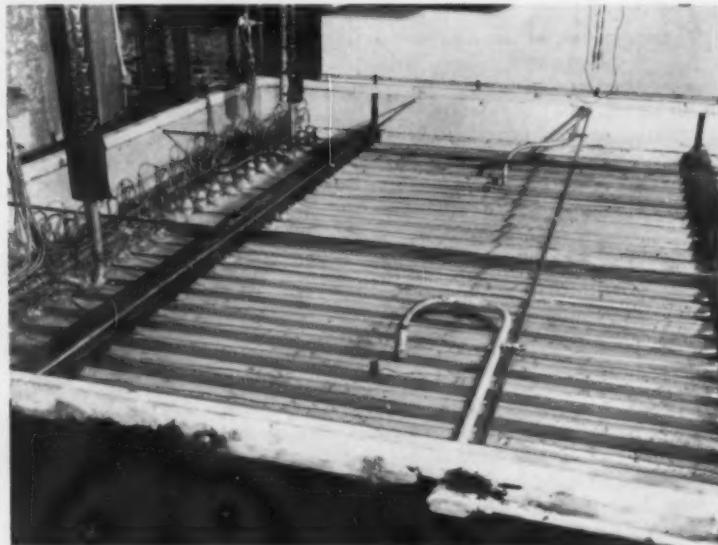
WHERE YOU CAN USE IT

You can use the ice bank system in such widely-varied applications as churches, funeral homes, cafeterias, auditoriums, lodge halls, motels, bowling alleys. It's a natural wherever occupancy or usage imposes high but short peak loads. You can also use it to provide added capacity to existing airconditioning systems. And the bigger the job the more important the advantages of this system become.

Churches are perhaps the biggest users of ice banks. Services are short but demand a lot of cooling. And the many other church functions result in varying load demands. The equipment can be designed to burn off only part of the ice during periods of light loading so there is plenty ice left for heavier demand periods.

The tremendous potential of booster applications has barely been touched. It's waiting for you. Many systems don't have enough tonnage, either because the job was sold at a price or because the load conditions have changed since the system was installed, requiring more capacity.

EVEN ICE BUILDUP on plates in this tank is made possible by having an individual expansion valve on each coil. This is advisable where plates must be set close together. Otherwise, uneven ice buildup would cause bridging between plates.



You can hook up an ice bank to the old compressor to build up reserve cooling capacity in off-peak hours. This is specially effective in restaurants, where peak loads are from 11 a.m. to 2 p.m. and from 5 p.m. to 8 p.m.

For another example, consider the 50-ton system in a typical bowling alley. It does a good job of cooling from 10 a.m. to 7 p.m., when the alleys start to fill up for the evening. From 7 p.m. until 11 p.m., however, an added 25 tons of cooling per hour is needed. To get these additional 100-ton hours, the same 50-hp compressor runs the ice bank system overnight to build up this reserve capacity for the next evening's extra 100-ton-hours.

Although it has many advantages and applications, the ice bank system is not intended to replace all direct expansion or chilled water systems. However, where large tonnage capacity is needed for periods up to six hours, as in churches, the ice bank system has a definite advantage. It also works well in smaller tonnage applications where zoning is indicated and the load isn't constant, as in motels and funeral homes.

HOW TO APPLY IT

The larger the evaporator surface, the more efficient the compressor operation. This makes the use of a smaller compressor possible. But sometimes the savings made in the compressor won't pay for the extra evaporator plates required. So you must determine the most economical combination, yet remember the power demand factor.

The ratio of evaporator surface to compressor capacity should be high so the compressor will operate at an efficient back pressure. For economy, though, the evaporator should be as small as possible so enough ice builds upon each coil to handle peak loads.

You must maintain a balance between the available buildup time, the amount of ice you need to build, the compressor capacity to build it, and the evaporator surface it is built on.

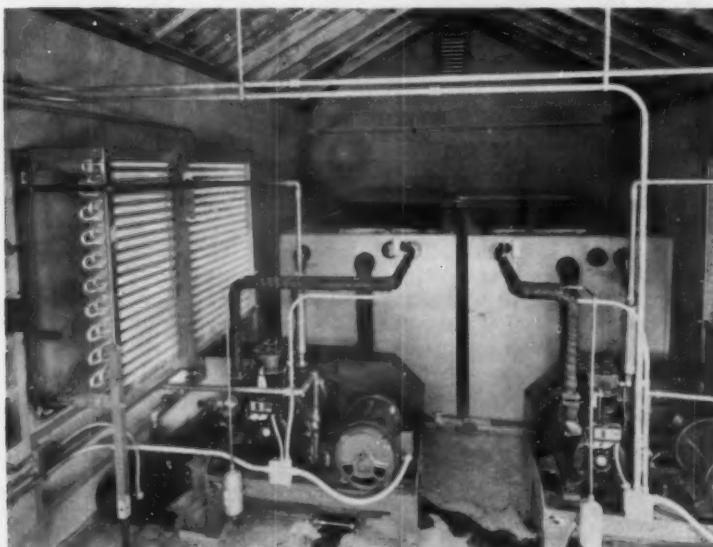
You must also maintain a minimum rate of circulation of the water through the system. This gives a uniform ice burn-off so some parts of the plates won't be bare while others have an excessive ice buildup. Uneven buildup leads to ice bridging between the plates, hampering circulation and making the water short-circuit. The water coming into the tank should either travel the full length of the coil or it should enter the tank with enough velocity so the rest of the water is well agitated.

The water outlet temperature from the tank depends on the inlet temperature, regardless of the amount of water circulated above the minimum required. There isn't much difference at various velocities because the capacity is directly proportionate to the volume of water passing through the system.

The higher the temperature of the water entering the tank, the greater the temperature difference across it. This is important, because you can't specify inlet water temperature and expect to have the outlet temperature you want. In other words, you can't expect to get 36 F water out while putting 51 F water in by relying only on the ice bank's heat transfer. You can get a 36 F outlet temperature, however, by bringing the return water down from 51 to 41 F with a bypass valve.

Always put the inlet piping for the water coming into the tank under water for two reasons. One is that it prevents air from backing up the piping and causing an air lock at the highest point in the system. The second reason is that whatever

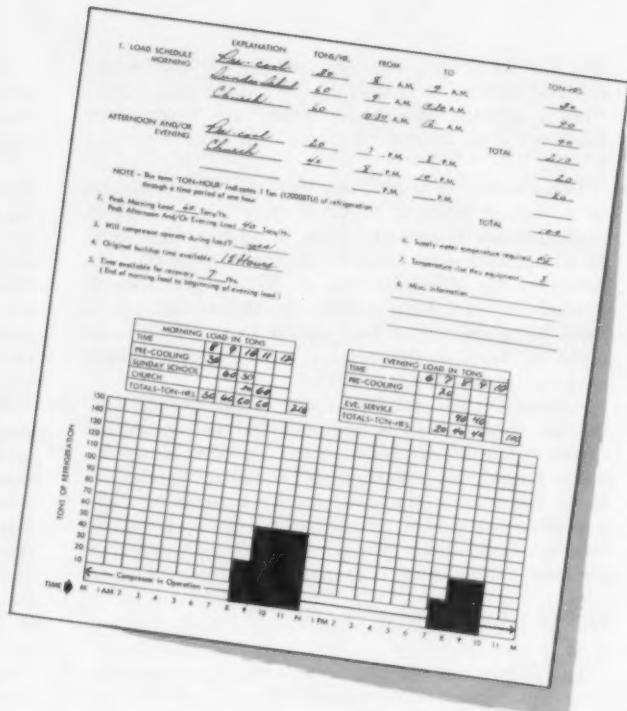
Continued on page 40



DOUBLE ICE BANK system for this church airconditioning job uses separate compressors, condensers, and all other components of conventional refrigeration systems. To provide most cooling at least cost, each system operates independently of the other.

ICE BANK AIRCONDITIONING

HOW TO FIGURE an ice bank job is shown on this sample work sheet. Note that morning and evening loads are plotted separately, and that original buildup time and recovery time are included in the calculations.



device is used to bring the water into the tank will also be more effective in agitating the water.

You don't need to figure vertical head pressure on the pump, because the weight of the water coming down will offset (other than line loss) the water going up, as in a siphon.

Factory-built ice bank units usually have water distributors. On job-built tanks, the inlet water header, or manifold, may consist of pipe at right angles to the plates. Branches of pipe nipples about 3 or 4" long are welded into this pipe at intervals between the plates. These nipples are usually of 1" pipe or smaller, threaded at the open end.

If you find that the water doesn't come out of these nipples at sufficient velocity, you can screw a reducing coupling on each nipple for a greater water throw.

The same size pipe is usually used in the outlet header, but holes are drilled in the sides of the pipe equal in size and location to the nipples on the inlet header.

The inlet header, of course, is located at the top of the tank and the outlet manifold at the bottom. Allow enough space between the headers and the coils to prevent the possibility of either inlet or outlet freezing.

If the actual airconditioning load should exceed the estimated load so long that the system uses up all the ice on the ice bank, the system will continue to operate as a straight chilled water system, but it probably won't have enough capacity to handle the job. This can be overcome by filling the tank with purchased ice. Sometimes it is advisable to attach an ice chute to the tank for just such emergencies.

HOW MUCH IT COSTS

Let's look at an actual church airconditioning installation. The total capacity required for the church and its related facilities is 440 tons. The total expected peak load for Sunday is 2245 ton-hours.

Initial cost for the complete airconditioning system, not counting the refrigeration plant, was \$135,000.

Lowest quotation for a direct expansion refrigeration plant was \$67,800. Cost of the ice bank refrigeration plant installed was \$41,276.

Estimated annual power cost for a direct expansion system was \$3578. Power cost for the ice bank system proved to be \$1305 per year.

You can see from this that the installation of a direct expansion refrigeration plant would have cost \$26,524 more than the ice bank plant, while its annual power cost would have been \$2273 more.

Total installed cost of the ice bank system was \$400 a ton. It would have been \$460 a ton for direct expansion cooling - 15% more!

Electric bill of this church for the last summer without cooling was \$2734. The cost the next year was \$3440 with ice bank airconditioning. This increase of \$706 represents 74,780 kwhr used by the airconditioning system.

One reason for the low cost of operation is that the ice bank was run entirely during off-hours. Also, there was no demand charge by the utility for the system's refrigeration plant.

Electric utilities like the ice bank system even though it uses less power because the revenue per year per kw of maximum demand is greater than that yielded by a direct expansion system. ♦

REPLACEMENT SELLING

of package commercial airconditioning

GORDON ANDERSON, *assistant editor*

*What's the real story
on the replacement market for
package commercial airconditioning?*

*How big is it now? What does
it look like for the future?*

How can the contractor cash in on it?

*What are manufacturers doing
to support it? To find the answers
to these questions, assistant editor*

*Anderson spent weeks gathering
facts, checking statistics, talking to
manufacturers and contractors.*

*He reports the results of his
investigations on these pages.*

"**R**eplacement sales of commercial package airconditioners are a good, strong part of our business — about 20% — and we look for them to increase steadily."

"**F**or us, the package airconditioning replacement market is practically non-existent."

THESE CONTRADICTORY QUOTATIONS are straight from the lips of two airconditioning contractor-dealers. Both men operate sound, profitable organizations. Both enjoy a good business volume. But they view the replacement market for package commercial airconditioners as if they were looking through opposite ends of a spyglass.

Somewhere between these two extremes you'll probably find how large a part replacement sales play in your operation. Or how large a part they could play.

There are several ways of going after this growing market. A few of them are:

- Regular calls by your maintenance men and sales engineers.
- Direct mailings to customers with units over 10 years old.
- Cold canvassing of these customers by your salesmen.
- Follow-up the direct mailings of manufacturers.
- Continual check of remodeling or expansion building permits.

But most contractors agree that the serviceman is the key to selling the replacement market. He's the

Continued on page 42

How big is the replacement market?

FACT: 4,777 drug stores installed airconditioning in 1959.

FACT: Nearly half of them — 2,340 stores — installed it to *replace* existing equipment.

These facts, reported in a survey by *Drug Topics* magazine, strikingly highlight how big a replacement market exists today for package commercial airconditioning. And with more units reaching replacement age every day, tomorrow's potential will be greater yet.

The industry figures the average life expectancy of a package commercial airconditioner to be 10 to 15 years. Drug stores were among the first commercial establishments to install airconditioning. So it is only natural that much of the equipment sold to them prior to World War 2 and soon after now is being replaced by modern airconditioners which offer better control of temperature, humidity, and air distribution.

The DuPont marketing study of commercial and industrial airconditioning, the most comprehensive ever attempted, shows that 120,000 package commercial airconditioners were installed in commercial and industrial establishments from 1946 through 1951. All of these units are now in the 10 to 15-year range, making them ripe for replacement (if they have not already been replaced).

In the years between 1952 and 1957, when this survey was made, another 484,000 units were installed. Each year another sizeable block of units

moves into the replacement age bracket. So you can see the replacement potential that lies just ahead.

None of these figures include room units, many of which are used in commercial applications in offices, small retail shops, hotels, motels, and hospitals. Life expectancy of these units is pegged at 5 to 10 years.

In addition to drug stores, biggest markets for replacement sales of package commercial airconditioners are supermarkets, drive-in restaurants and other small eating establishments, bars and taverns, for these are the fields in which this type airconditioning first got a hold.

Another spur to the replacement market is the fact that so many manufacturers have jumped in and out of the package commercial airconditioning business, leaving behind them an ever widening circle of orphan makes. For example, when THE REFRIGERATION & AIRCONDITIONING BUSINESS published the first of its annual airconditioning specifications series in 1953, 19 manufacturers reported that they made this type of equipment. In 1960, seven of these makes were no longer listed. By 1957, the number of manufacturers reporting had jumped to 40. But of these, 14 were gone three years later.

Even though these orphan units have not reached the normal replacement age, it becomes increasingly difficult to get replacement parts for them. This makes their owners definitely vulnerable to a replacement selling pitch.

REPLACEMENT SELLING

man who is right there on the job. He's the man the customer believes and trusts from past calls. He's the man who sees the unit is either completely shot or will cost the customer a lot of money to keep it working.

You have to train your servicemen to be aggressive and alert to possible replacement sales and to give the leads promptly to your salesmen. If they don't or won't, you have no entry to the market. If properly schooled along these lines, though, they can get you in on the ground floor. They can prepare the customer for a replacement sale by reminding him on each service call that his unit won't last forever, and that service costs on it are mounting steadily.

Make sure your serviceman acts at once when he learns of a man who needs a new unit, or even shows an interest in one. If he doesn't act promptly, some other contractor will get the tip and sell him.

Profit margins hold up well in the replacement market. There's little cutthroat price competition, since the customer buys only when he feels he has to then he needs the new equipment in a hurry. At that point he's generally in no position to go bargain hunting.

Timing is all-important. If you are there at the critical moment, chances are you'll get the job. The customer is not likely to take the chance of losing business to his competitors because his airconditioning isn't working, so you have to be ready to sell him in a hurry.

Successful replacement sales through the serviceman are built on confidence. The customer must be-

lieve in your serviceman and in your company's reputation.

Don't oversell your servicemen on such plus business. Don't make the incentive too great, or they'll be tempted to try to turn every service call into a sale, whether or not the equipment really needs replacing. This will stick you with customers who swear at you, not by you.

From your experience in selling new installations you know that many customers will instinctively resist your sales efforts up to the very last minute before they must have the equipment. This is true of the replacement market, too. Most contractors told me that they go after replacement sales most actively in winter, when business tends to slack off, but that most orders for them don't come in until May or June. So now is a good time to give an extra push to your replacement sales efforts.

What are manufacturers doing to promote replacement sales of package commercial airconditioners? Very little.

The attitude of many is summed up by one sales manager who told me bluntly: "We do not have any specific promotional programs to go after the replacement market at this time. We feel that only 1 out of 20 units we sell — or perhaps even less — is installed as a replacement."

Another, somewhat less pessimistic, reported: "According to our analysis, replacement sales today account for something less than 15% of our industry's annual potential." But he couldn't tell me of any constructive steps his company was taking to go after this sizeable chunk of business.

Still another declared that "any installation completed before 1950 is a potential replacement customer." But here again it was all talk and no action.

Hopeful sign: one major manufacturer candidly admitted to me that maybe he is overlooking a good bet. "We have not concerned ourselves with the specifics of this market," the sales manager said in true executive-type language, "but we undoubtedly should start paying more attention to it than we have in the past."

What does all this add up to? One inescapable conclusion: contractors, on the whole, are missing the boat when it comes to replacement selling of package commercial airconditioners. They fail to recognize the potential of this market. They have not geared their operations to cash in on the plus business it can bring them.

And most manufacturers have done little or nothing to open their eyes.

This market is worth going after today. It will offer even more profit potential tomorrow and the day after. The statistics bear this out. So do the experiences of those contractors who have really given replacement selling a whirl.

How long can you afford to ignore this important chunk of business? ♦

Turn to pages 44-46 for case histories
of contractors active in replacement selling

What contractors say about REPLACEMENT SELLING

SID KAHN, president

Kadar Air Conditioning Co., New York City

"Replacement sales of commercial package units make up about 20% of our business. It's a good strong part of our sales and we expect the dollar volume to go up."

"We get this business in two ways: First, recommendation by our customers. This is the payoff on trying to run an honest business with good service. Second, from our own service and maintenance records. We figure that after 10 years, a unit may be ripe for replacement."

"We don't just go out to replace a unit because it is 10 years old, however. Our records indicate when equipment is starting to give enough trouble to make it worthwhile to consider replacement."

AL SHERMAN, sales manager
Hattenbach Co., Cleveland, Ohio

"The responsibility for getting replacement sales and replacement sales leads is divided among the serviceman, advertising, and direct mailings by both us and our manufacturer. A very minor portion of our replacement business, I'd guess less than 1%, is the result of canvassing by our salesmen."

"Most of our replacement sales are in up to 25-ton package units. Our total replacement sales are about 3 to 5% of our total business, but appear to be getting bigger."

"We generally try to talk the customer into replacing, not repairing, most airconditioners over 12 years old, although many may last at least 15 years."

WALTER McCARTY, president
McCarty Bros. Equipment Corp., River Forest, Ill.

"The replacement market is one that cannot be created and is one that feeds on itself. It is getting bigger as a percentage of total industry sales — about 5 to 7%, I'd say. But it isn't profitable to increase it yet because we have to put men out on the street calling on customers with older units. However, it will increase because more package units were sold in the late 1940's and 1950's."

"The serviceman is the key man. If the customer has been satisfied with his service, we have a good chance to sell him replacement equipment when the time comes. We know by the number of service calls if the unit may need replacement."

Continued on page 44

WHAT CONTRACTORS SAY

Continued from page 43

LEONARD MORRIS, president
Five Towns Refrigeration Co., East Rockaway, N.Y.

"The replacement market is practically non-existent for us."

"We think the reason is a top-notch service and maintenance program."

"Equipment ought to be good at least for 15 years if it gets proper servicing and if the water is properly treated. Proof of this is that after 15 years we have sold so few replacement units."

"The market will certainly develop as equipment now in use gets older. The biggest replacement sales will come from smaller stores because they are the ones who are least likely to have service contracts and the ones who are least likely to take good care of their equipment."

RICHARD B. ENGLISH, executive vice president
Murphy & Miller, Inc., Chicago

"We do not knock on doors for the replacement business because the man who gets it is the serviceman. If we don't have the customer now, we will have to get him on service before we can sell him replacement units."

"Although replacement sales are about 7% of our business, we and the whole industry could increase them if we promote it by: 1) direct calls by our service or sales representatives; 2) direct mailings to owners who don't have any one service company; and 3) using certain men to sell service and replacement sales only."

"The success of replacement selling depends on two things. One is convenience — what you can offer the customer now. The other is confidence — what kind of a service reputation you have built with your customer and what kind you build on your first service call to the uncommitted owner."

RICHARD A. RAUCH, sales manager
Gotham Equipment Corp., Richmond Hill, N.Y.

"Replacement selling boils down to selling your service facilities, not to advertising or to door-to-door selling."

"Our share of this business depends mainly on our service contracts and on our maintenance. The serviceman knows the condition of the equipment and he is in a position to recommend to the owner that he buy a new unit instead of repairing the old one, when this is a better choice. Too, the customer knows him and has confidence in his integrity, so he's apt to listen to his advice."



Talk dollars-and-

FIND A PROSPECT whose equipment has reached the replacement age. Figure out how much it's costing him in service. Then show him how much he can save by installing new equipment.

That's the way the S. J. O'Brien Companies sells thru-the-wall airconditioners as replacements for window units in commercial installations.

Success of this approach is demonstrated by the fact that this New York City contractor has sold nearly 7000 thru-the-wall airconditioners since 1956 by offering the customer a money-saving installation-service package. This replacement business has become an important part of the company's annual volume.

"We know that a typical multi-unit service contract for window airconditioners in our area costs the owner \$90 a unit a year," says H. B. Hamilton, O'Brien vice president. "This includes removing the unit in the fall, cleaning, inspection, oiling, packing, storage, and installing it again in the spring."

"A few years of such maintenance often costs the customer more than he paid for the window unit. By selling him thru-the-wall equipment we can save him \$550 per unit in the first 10 years of operation."



SIZEABLE SAVINGS in maintenance costs demonstrated by a New York City contractor sold the management of the Essex House hotel on replacing its old window airconditioners with thru-the-wall units. Inset shows workers installing a sleeve in the opening cut for one of the new units.



REPLACEMENT SELLING **Case History/1**

cents to replacement prospects

After three to five years of operation, window unit repair costs generally start to mount. The owner then is most vulnerable to suggestions by O'Brien salesmen that he modernize his airconditioning with thru-the-wall units.

This contractor's sales story assures the owner that the complete installation is guaranteed for the first year, and that the condensing unit is warranted by the manufacturer for five years. From the second through the fifth year the O'Brien organization offers a service contract for \$25 a unit a year in multi-room buildings like hotels and hospitals. In co-op apartments, the service contract costs are higher.

After the warranty period expires, the service contract price rises \$5 a unit a year to cover the hermetic condensing unit.

The O'Brien service contract covers service calls, inspection, replacement of all parts as needed, removal and cleaning of the unit, recoating the condensate pan to resist corrosion, and lubrication. Because the unit is permanently installed, there are no packing or storage charges.

Hamilton points out that on this basis building

owners who replace window units with thru-the-wall models can save \$300 a unit in the first five years and another \$250 in the second five years. These savings are all in service costs. "Every building manager-owner really appreciates this kind of arithmetic," he declares.

Installed cost of the thru-the-wall units ranges from \$750 to \$1000 per unit, Hamilton reports, including electrical hookup and the one-year guarantee. On quantity installations the cost drops to less than \$650 per unit, excluding electrical wiring.

As an example of how this replacement program based on service savings works, Hamilton points to New York's Essex House hotel. Here, O'Brien is replacing window units with thru-the-wall airconditioners at the rate of about 150 units a year.

An important factor in assuring satisfaction of thru-the-wall installations is the way in which the wall opening is cut and the unit is fitted and sealed into the opening. O'Brien subcontracts this work to Brisk Waterproofing Co. This firm has developed special techniques and equipment for making leak-proof thru-the-wall installations without damaging the facade. ♦

REPLACEMENT SELLING **Case History/2**

Build a quality reputation if you want replacement business

"WE ARE SUCCESSFUL in replacement sales because we are a quality organization in all respects. This doesn't mean only the equipment we sell and the engineering and service we give every customer. It also means that we have men working for us whose family life and community reputation is also top quality."

This business philosophy of quality and integrity in every way is what has made John H. Couse Air Conditioning, Inc., West Palm Beach, Fla., one of the most successful contractors in the southeast.

"Time and time again," says vice president Frank M. Seay, "we get replacement business for only one reason: we have impressed the customer with the fact that our organization is the finest available, so he has convinced himself that no other will do."

Many contractors make a practice of quoting the lowest price and the cheapest installation. And the customer usually ends up getting the cheapest workmanship and the cheapest service!

Not with Couse, though. "We have never been the low bidder on any job," says Seay, "and we never intend to be. We sell our service and our product, not our price. In every installation we have made, the customer has always received more than he had planned on. That's why he comes back again when he's ready to replace the equipment."

Back up promises with performance

"Maintaining quality often seems the tedious way of doing business, but the honest way is usually the easiest in the long run and it pays off in satisfied, repeat customers," Seay states.

Couse believes in backing up its promises with service integrity. He knows you can't put a price on customer inconvenience or aggravation.

Here are a couple of examples of how Couse's insistence on quality pays off:

The airconditioning system in a local bank began to be one continual source of service headaches. This 10-year-old central station job had refrigerant pipe strung all over the building and air handling units tucked here and there. The bank was often without cooling because of equipment breakdowns. The piping leaked so badly that the installer kept two drums of refrigerant connected directly to the system, and had a serv-

iceman stop by once a week to charge enough into the system to offset the loss.

Finally the bank decided to have the system completely overhauled. The proposal Couse submitted for this job carried a price tag of \$33,000, against a \$17,000 bid by the original installer. Couse got the job because the customer had been so unhappy with the performance of the original system, and because Couse has the reputation of having a reliable service organization.

This job has been in operation six years and not once has the bank been without cooling because of equipment failure. Monthly service charges fell from \$200 to \$35.

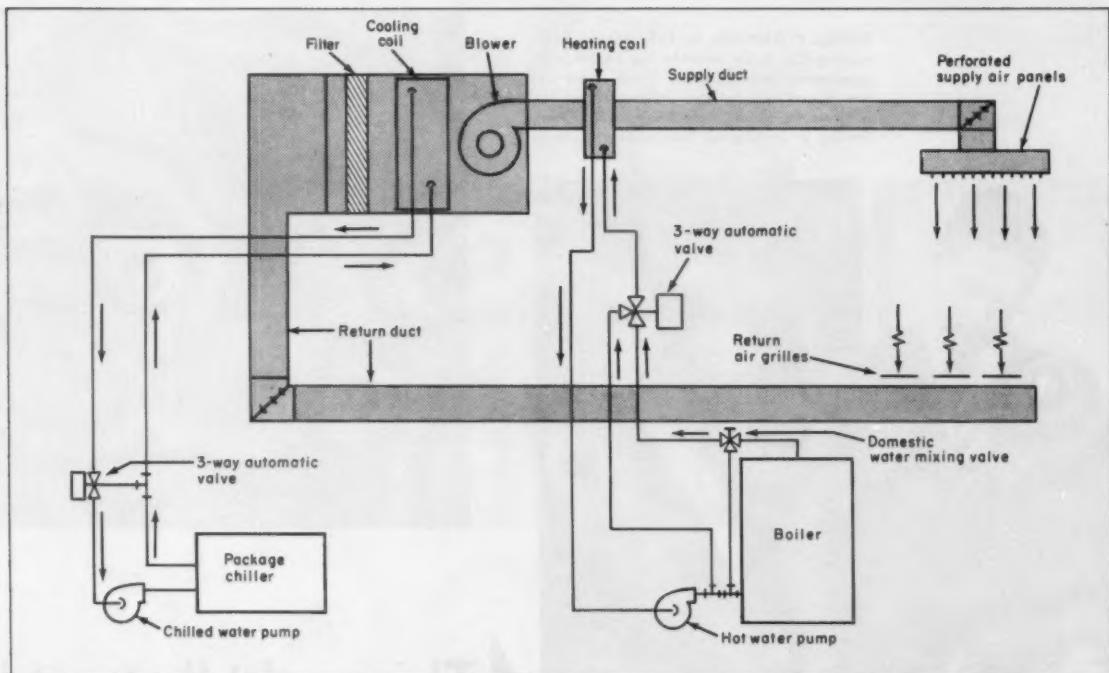
Result: the bank has referred to Couse more than half a million dollars' worth of work from other banks and businesses.

You can't put a price on aggravation

Couse was called to a new building whose owner was not satisfied with his airconditioning installation although it had been in operation only a year and a half. The 5-ton system had been installed with a $\frac{1}{2}$ -hp condenser water pump, $\frac{3}{4}$ " condenser water piping, and atmospheric cooling tower. The tower was surrounded by shrubbery and covered with mosquito netting to keep out leaves. The air distribution was poorly designed, and the whole job just didn't operate properly.

The system cost \$3500. Couse quoted \$6000 to replace the basic cooling and heating plant, including condenser water pump and piping, and cooling water. The original installer quoted \$1300 for replacement of only the basic machinery, leaving the existing tower and condenser water pump and piping in place. Couse got the job, because the owner willingly paid the higher price to eliminate any future aggravation and inconvenience.

Selling quality has still another advantage, Seay maintains. It's gilt-edged protection against the effects of general business recession. "We have found," he says, "that the people who insist on dealing with a quality company have the money to pay the best price, and will not put up with second-rate equipment or service even when times are tough. As a result, our best years have been recession years." ♦



PRECISE TEMPERATURE REQUIREMENTS for a gage laboratory were satisfied by this airconditioning system. Both air distribution system and water circuits are shown. Shaded areas designate air

movement. Boston Airconditioning designed this system. It maintains temperatures of 68 F plus or minus 0.2 degree at Van Keuren Co.

Contractor meets critical temperature requirements — and then some!

AN AIRCONDITIONING CONTRACTOR seldom has to design a system that will hold a temperature within less than 0.5 degree. Boston Air Conditioning Co. of Medford, Mass., was asked to do it at Van Keuren Co. in nearby Watertown.

Van Keuren originally specified a tolerance of 0.1 degree, but due to the cost of instruments to get this extreme accuracy, it was decided to first use standard manufactured commercial controls.

Boston Air Conditioning's chief engineer Quentin O. Theroux designed this system. His creation maintained temperatures of 68 F plus or minus 0.2 degree dry bulb and not over 50% relative humidity.

These strict temperature requirements were for an inner laboratory in Van Keuren's completely airconditioned building. They needed the close tolerance for making gages and machine parts to a 10-millionth of an inch.

One help for Theroux in controlling temperature was that technicians using the 10 x 12' inner lab work

alone for several hours at a time. The area is surrounded by an inspection room and production area in which temperatures are held at 68 F plus or minus 1 F. This minimizes heat transmission in and out of the inner laboratory.

A 900 cfm fan-coil unit with a chilled water coil and hot water reheat coil serve the laboratory. A 2-ton package water chiller with pump supplies water to the cooling and dehumidifying coil. This chiller supplies nearly constant-temperature chilled water to one port of a 3-way automatic mixing valve. Water from the coil is supplied to the other inlet port return.

A 3-way automatic chilled water control valve is positioned by a cooling coil discharge duct thermostat to bypass the cooling coil as required. Since the cooling and dehumidifying load is nearly constant and has practically no sudden changes, there is much stability and little variation in air temperature.

Continued on page 104

TOTAL PLANNING by Refrigeration Engineering Co. made possible this 34,000-sq.ft. supermarket near Bellevue, Wash. Store fixture department manager Stanley Young (at left) works closely with his assistant, Alan Gallie, in developing independent markets.



This contractor-dea

... for merc

HERE'S A SALES APPROACH that offers the independent grocer the complete planning package he vitally needs to compete with supermarket chains.

This package was devised by Refrigeration Engineering Co., Inc., of Seattle, Wash. It goes a step beyond just selling installation and service of store fixtures. It includes banking, real estate planning, aerial surveying, personal economic counseling, as well as overall store design.

How does it pay off? In the resulting business that comes from the engineering, sales, installation, and servicing of the customer's refrigerated food equipment.

Does it pay off? It has sparked an increase in sales from \$30,000 to \$430,000 in eight years.

Vice president J. L. Brohamer told our reporter this: "The supermarket chains usually have market analysts, real estate experts, financial managers, engineers, and purchasing agents. The independent has none of these, yet he needs all of them to compete for the customer's dollar."

"Our service is aimed at guaranteeing the independent grocer a good chance to get this dollar," said Brohamer.

It was one of these small grocers that got Refriger-

ation Engineering started on these development programs, reported Stan Young, manager of the store equipment department.

"A friend of mine asked me for some advice. He had been offered a location for a new market in a nearby city, but knew nothing of its possibilities.

"I knew we needed data on population density, average purchasing power in the area, neighborhood growth potential, competitive activities, and relative property values.

"When we finished gathering our information, we found that shoppers in the surrounding area were spending about \$2 million in distant food stores. If my friend could get half of this business, he could make a profit.

"The bank authorized a loan after seeing our documented survey information. We also used this data to design a store to fit the needs of the community.

"Today, eight years later, my friend is grossing \$1.5 million. This is well over our original estimates."

Young was impressed by all of this. He figured since refrigeration and airconditioning equipment in modern markets is invariably the biggest investment, it would be natural that he help the independent with the maze of problems involved in starting a new store.



ler has all the answers

Chants planning new food markets

So Young programmed a series of weekly meetings to teach sales personnel the fundamentals of commercial real estate, finance, and market analysis. Banks, real estate firms, and mortgage groups helped out with information.

Soon Refrigeration Engineering became a haven for store managers and employees wanting to open their own businesses. "We did it without publicity," Young said, "word just got around."

People came to Young after contacting bankers who didn't understand the grocery business or after talking to real estate people who couldn't help with financing. "Without our help, many of them would still be working for someone else," related Young.

Refrigeration Engineering does not offer a contract with a prospective customer binding that client to buy equipment. A salesman from Refrigeration Engineering merely discusses the client's problem. However, of all the people aided by the contractor, only one has gone elsewhere for its engineering, equipment, or service.

But, there are some delicate problems. One involves the choice of an architect.

"We encourage our customer to pick his own," explained Brohamer. "We can't afford to jeopardize our

standing with professional designers and architects by playing favorites. We tell our customers to look over the field and pick a man or firm that seems to understand his problems. After an architect is selected, we contact him."

Refrigeration Engineering's success in market analysis and store development has led it to take options on undeveloped real estate which shows excellent market potential. Then the contractors shop around for a taker.

Brohamer said that banks, real estate operators, and mortgage firms often refer persons to him that are anxious to build or remodel grocery stores.

"As far as we are concerned," admitted Brohamer, "our system is the answer to the problems created by the big market chains' method of store development. When they come in with completely engineered drawings and firm commitments with refrigeration equipment manufacturers, there's not much left for us other than low-profit installation and maintenance work."

"Now that we can provide the independent the same services that supermarket chains supply, we've helped put the independent back in business. And, we've built quite a big following for ourselves." ♦

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MAY 1961/THE REFRIGERATION & AIR CONDITIONING BUSINESS

Applications MANUAL

ARTHUR H. FARR, consulting editor, airconditioning

Motor-compressor burn-outs:

how to detect and treat starting burn-outs

You'll find two distinct types of burn-outs in refrigeration and airconditioning systems powered by hermetic motor-compressor units: starting burn-outs and running burn-outs.

Starting burn-outs can be caused by failure of the motor insulation, lead wires or terminals. Because electrical stresses are highest at instant of start, a short circuit can result and the motor burn out before it starts to run. When this happens, temperatures of over 3000 F can occur for a moment, causing the formation of carbonized deposits and fumes.

Running burn-outs occur slowly, rather than instantaneously. That makes the problem more serious. Since the compressor continues to function, the sludges and acids formed are circulated to all parts of the system. These contaminants can be extremely difficult to remove. The longer the system continues to operate in this condition, the worse the situation becomes.

In this article we'll tackle only the problem of starting burn-outs.

Check extent of damage to system

The sooty contamination caused by the extremely high temperature generally is confined to the motor-compressor unit. Since the burn-out occurs in an instant, and before the compressor starts up, the pistons and discharge valve plates keep the contaminant from flowing to the highside of the system.

Smoke and soot from the short circuit fire will back up into the suction line, however, because it is connected to the motor end of the hermetic enclosure. Occasionally on a starting burn-out the compressor may turn over a few revolutions. This will move the contaminant a few feet down the discharge line, but seldom farther than that.

A chemical test is now available to simply and accurately determine the acid content of a system, and consequently the severity of the burn-out. But visual inspection can give you a good clue.

Most accessible hermetic compressors have suction and discharge service valves. Close them tight and

vent the compressor to the atmosphere. Be extremely careful in doing this, because the compressor may contain acid gases which could cause lung damage if inhaled.

Next remove the service valves and inspect them. Also inspect the compressor discharge and suction passages. If the discharge side of the compressor is clean, the highside of the system is uncontaminated and you know that you have a starting burn-out on your hands.

Be sure to wear rubber gloves when handling the compressor or service valves until you are sure that no hydrofluoric acid has formed in the compressor or the system, because this acid will burn and blister your skin on contact.

Follow these cleaning procedures

Here's how to clean out a hermetic system after a starting burn-out.

First, discharge all the refrigerant and oil mixture in the liquid phase through a suitable line run to the outdoors. This is a necessary precaution, as gassing off the refrigerant would concentrate any solids or liquid contaminants in the system.

If soot has backed up the suction line, cut this line at the first 90-degree elbow. Contamination rarely will go beyond this point. Confirm this fact by inspection, purge the system by admitting new refrigerant through the discharge service valve, and replace the short section of suction piping with new copper.

Connect the service valves to the new compressor, install a new liquid line filter-drier, and check the system for leaks. Now you are ready to evacuate. Never try to do this by running the refrigeration compressor. You must use a good commercial vacuum pump.

Draw a vacuum of 50 to 150 microns by connecting the vacuum pump to both the highside and lowside of the system. It is almost impossible to evacuate the

Continued on page 52

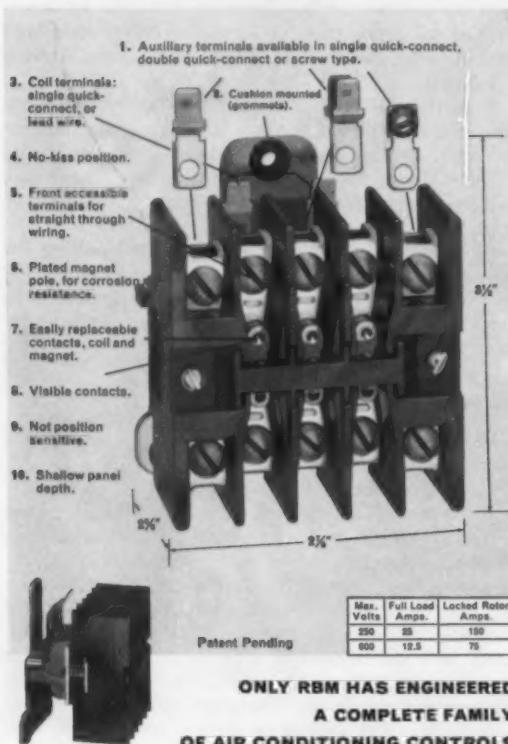
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Applications MANUAL

Continued from page 51

system with a single connection, because the cap tube or the expansion valve cuts off half the system from the evacuation.

Break the vacuum with the refrigerant normally used in the system. Use a factory-filled cylinder for this purpose, as well as for recharging the system, to minimize the chance of introducing any moisture into the system through the refrigerant.

Now repeat the entire evacuation procedure twice more.

Start evacuation only after the system has been exposed to an ambient at least as high as 60 F long enough to equalize at that temperature. If you attempt to evacuate at a lower ambient, system moisture may turn into ice before it can be removed.

On the first pull-down, operate the vacuum pump for at least 3 hours. In fact, it may be wise to let it run all night. When the pump has dropped the system pressure down to a value corresponding to the vapor pressure of the water in the system, the moisture in the system will start to boil off. The boiling will proceed fairly slowly as long as any free water remains in the system, but when only absorbed moisture is left the process speeds up and dehydration is soon complete.

After you have completed the triple evacuation, charge the system with new oil and refrigerant and operate it for 48 hours. Then check the oil visually. If you note any discoloration, replace the oil and install a new liquid line filter-drier. Recheck the oil again after 2 or 3 weeks of operation, and again replace the oil and the drier if you note any discoloration. Repeat this process until the oil remains clear.

In the March issue, consulting editor Farr outlined some of the causes of hermetic burn-outs. In July he will talk about the tougher problem of handling a running burn-out.

Financing plan now available for G.E. leak detectors

You can now buy a General Electric H-6 electronic leak detector on time. This new plan is available to refrigeration and airconditioning equipment servicing organizations and independent servicemen through the G.E. Credit Corp.

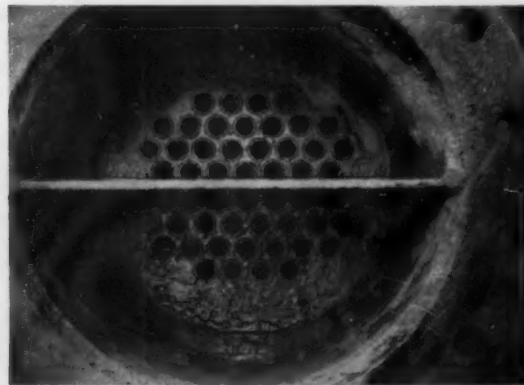
Purchasers may make a small down payment, then spread the remaining payments over a 12-month period.

This highly sensitive leak detector was described fully in the December 1960 issue of THE REFRIGERATION & AIRCONDITIONING BUSINESS in an article on special service equipment.

Descale cooling towers, evaporative condensers, ice-making machines rapidly, effectively with **dry acid** cleaners based on **Du Pont Sulfamic Acid**



SAFER, EASIER TO USE. Dry acid cleaners eliminate hazards of handling liquids, particularly where carboys are involved. These cleaners can be added directly to sump of cooling tower or evaporative condenser . . . dissolve scale fast—destroy algae, too!



LESS CORROSIVE. For descaling condenser tubes (above) and other parts, sulfamic cleaners are less corrosive than liquid cleaners . . . on brass, 60% less; on steel, 70%; copper, 85%; aluminum, 95%. Many sulfamic cleaners can be used safely on galvanized steel.



LOWER HANDLING COSTS. This 100-lb. drum of dry acid cleaner is more than equivalent to this carboy of inhibited muriatic acid weighing 192 lbs. You'll save on shipping, handling and storage expenses. And no deposits because drums are disposable.



NON-FUMING. These dry acid cleaners produce no corrosive gases, either dry or in solution. No harmful fumes to cause corrosion in vapor spaces of equipment or damage to electrical and operating parts . . . and never a toxic fume problem to personnel.

Ask your supplier for safer, effective cleaners based on Du Pont Sulfamic Acid or mail coupon for additional information and names of formulators who offer these compounds.



BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

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THE REFRIGERATION & AIR CONDITIONING BUSINESS/MAY 1961



E. I. du Pont de Nemours & Co. (Inc.)
Industrial & Biochemicals Dept., N-2545R
Wilmington 98, Delaware

Please send me your "Quick Facts on Dry Cleaners" booklet. names of formulators offering cleaners based on sulfamic acid.

Name _____

Company _____

Address _____

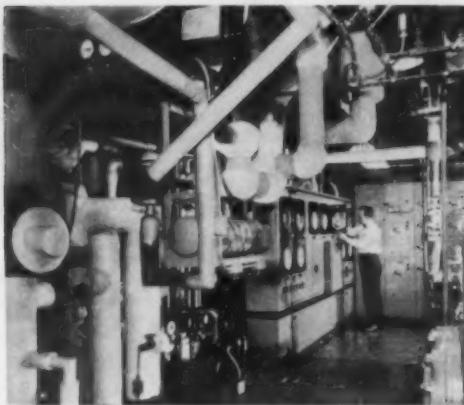
City _____ State _____

RECENT Installations

Trailer tests new products

A TEST MOBILE HOME, that has removable ceiling, sidewalls, and floor, is being used to test insulation, acoustical ceilings, resilient floors, and vinyl plastic wall surfacing under varying temperature and humidity conditions at Armstrong Cork Co. in Lancaster, Pa.

The trailer, a custom-built job that is 10' wide and 40' long, has wood frame, aluminum sidings and interior panels, and is in a building where



temperatures range between 120 and -10 F. It has hot flow meters, thermocouples both inside and outside the trailer that send data to the control panel, special humidifying devices, and differential transformers for studying construction expansion and contraction.

The facility, which can test two trailers at once, will also conduct outside weathering tests.

New towboat 100% airconditioned

THE NEW RIVER TOWBOAT, Patrick Calhoun, Jr., recently delivered to a barge line features 100% comfort airconditioning. Dunham-Bush console type room airconditioners are installed in the crew's quarters, guest rooms, officers' quarters, pilot house (shown), mess hall, and engine room control area. The units handle both cooling and heating needs and feature individual room control.

A remote Heat-X package chiller furnishes the chilled water which circulates through the units when cooling is required. The same piping is used to deliver steam for heating, which is supplied by unit heaters.

Air handlers fit tight quarters

AN AIR HANDLING SYSTEM designed around tubular centrifugal fans that eliminate duct elbows fits into two fan rooms only 9'8" high and yet efficiently airconditions the new computer department of The Travelers Insurance Co., Hartford, Conn. The big computer equipment hogs most of the 15,000-sq.ft. floor.

The fan rooms, each containing a pair of "TC" fans manufactured by Dryer Dynamics Corp., have dry and electrostatic filters, cooling and reheat coils, and cfm capacities of 24,000 and 29,000. Each fan has a 2-speed motor to double a fan's normal capacity if the other fan of the pair is shut down. Each fan takes about half the space of conventional scroll fans.

Meter records Btu usage at CBS

A METER THAT MEASURES BTU'S has been installed at Columbia Broadcasting System, Inc. to solve a consumption measurement problem involving two major, separate office buildings. It measures exactly how much chilled water for cooling is consumed by each of two CBS divisions. This data is necessary to determine how much of the cost should be charged to each division and for measuring the overall cost per Btu ton of chilled water used in the airconditioning system.

The "Pollux" mechanical meter used at and by CBS needs only to be read at regular intervals. Present plans anticipate monthly billing for Btu consumption based on monthly meter readings.

The meters are distributed by Air Conditioning Equipment Corp., New York City.

Central plant cools VA hospital

FIFTEEN BUILDINGS ON 85 ACRES, 4500 doors, 18,000 windows. These were the major problems that had to be overcome in the airconditioning of the \$20 million, 1000-bed Veterans Administration Hospital, Palo Alto, Calif. A built-up system operating out of a central steam and chill plant was the answer.

The Recold equipment—water coils, steam coils, separate airconditioning units, evaporative

Continued on page 56

ALCO'S
famous
402

THERMO® VALVES

The Small-Fixture Valve
For All Fixtures



IF THERE'S ROOM FOR YOUR HAND . . .
THERE'S ROOM FOR AN ALCO 402

NOW AVAILABLE 2 WAYS

- With BUILT-IN PRESSURE LIMITING ELEMENT—to prevent motor overloading and motor burn-out—denoted by the letters P.L. as #402-2F-PL
- Without BUILT-IN PRESSURE LIMITING ELEMENT—for installations not requiring protection against motor overload—denoted as #402-2F

Field proven models for
all these capacities:

REFRIGERANT-12
1/4, 1/2 and 1 Ton
REFRIGERANT-22
1/2, 3/4 and 1 1/2 Ton
REFRIGERANT-40
1/2, 1 and 2 Tons

These are your benefits

- ✓ LIQUID CHARGE—Install in any position.
- ✓ WIDE RANGE SUPERHEAT ADJUSTMENT—2 to 20° F—Easy External adjustment fits Standard Service Wrench.
- ✓ REVERSE SEATING—Assures smooth feed at all loads.
- ✓ RUGGED CONSTRUCTION — Brass, Bronze and Stainless Steel.
- ✓ REMOVABLE STRAINER—at inlet—Easy to clean.
- ✓ CAPILLARY AT SIDE—Allows more head room for mounting.



Call your Alco wholesaler—Write for Specifications

8216

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- BUY QUALITY
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ALCO VALVE CO.

643 KINGSLAND AVE. • ST. LOUIS 5, MO.

The one complete line of refrigerant controls: Thermostatic Expansion Valves • Refrigerant Distributors
Solenoid Valves • Suction Line Regulators • Flooded Evaporator Controls and Reversing Valves
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1 INSULATION FITS EVERY SIZE PIPE... ANY TYPE FITTING

Mortell NoDrip TAPE



No tools. No vapor-seals, no fasteners, brads or adhesives. Wrap NoDrip Tape spirally around any size pipe, joints, tees, valves, angles . . . and the job's done! NoDrip Tape is a pliable, cork-filled, self-adhering product. Forms a permanent air-tight, 100% vapor- and moisture-proof jacket. Stops condensation drip, sweating, frost. Ends rust and corrosion.



MORTELL NoDrip PLASTIC COATING

For big areas, large pipes, tanks, air ducts. Another fine Mortell refrigeration product. Applies with brush or trowel to metal, concrete, brick, plaster, tile or composition surfaces. Permanently stops condensation, rust, corrosion.

Mortell COMPANY

Makers of Mortite Caulking Cord and Mortite Caulking Gum

Mortell Company

548 Burch St., Kankakee, Ill.

Please send full information about the complete line of Mortell refrigeration products.

I am a Jobber Dealer Serviceman

Name _____

Firm _____

Address _____

City _____

Zone _____ State _____

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RECENT

Installations

Continued from page 54

condenser—provides controlled humidity and uniform air conditions throughout the general medical, surgical, and neuropsychiatric branches of the facility. Among the specialized areas which need flawless air cooling and heating are training shops, main kitchen and dining areas, and a nursery.

Cooling deals flat IBM cards

THE IBM CARDS AREN'T STACKED in a curled fashion at Trailmobile, Inc.'s Cincinnati, Ohio, offices because airconditioning keeps them flat for smooth feeding through the machines. Before the cooling capacity was increased, the cards would curl on days of high temperature and humidity, making feeding difficult.

The company installed two Dunham-Bush 15-ton packaged airconditioning units to boost capacity and thus control temperature and humidity in the computer department.

Continued on page 112

Turner **Leak**
detector

pinpoints halide gas leaks

FAST! PORTABLE! LOW COST!

Freon and other halide gas leaks are instantly located with the super sensitive and completely portable Turner Leak Detector. Built to withstand rugged use. Lightweight, small unit stores easily in tool chest for instant application anywhere.



New LP1157 Turner Kit includes Leak Detector, Propane Fuel Tank, 2 spare reaction plates plus FREE metal tool chest. Only \$13.95.

Use Turner Propane Torches to repair the leak. See the new Tradesman's Torch Kit in companion metal tool chest. Get details from your wholesaler or write



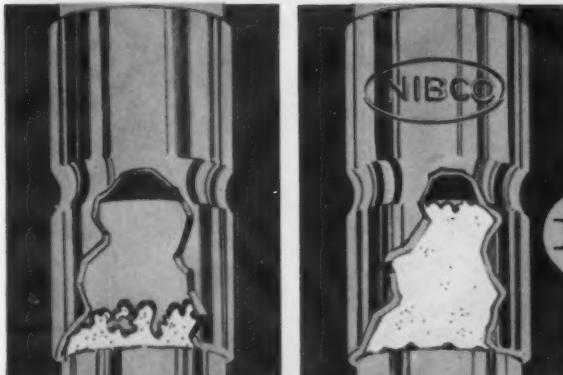
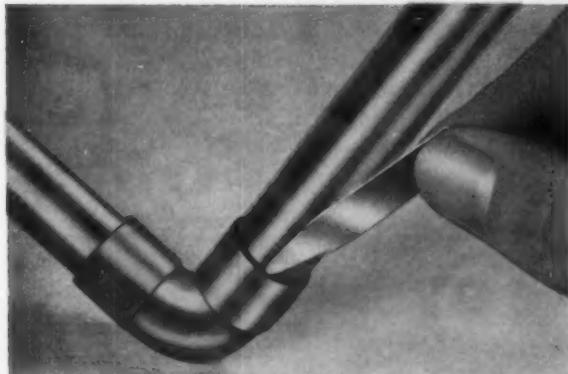
Turner Corporation

857 PARK AVENUE • SYCAMORE, ILLINOIS

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MAY 1961/THE REFRIGERATION & AIRCONDITIONING BUSINESS

THE MESSAGE OF THIS AD IS ON THE EDGE OF THE PAGE! • NIBCO



DEPTH OF SOLDER PENETRATION drastically affects the breaking load of the joint. When you have solder penetration of only one-third the cup depth of a $\frac{3}{4}$ " fitting, the breaking load will be approximately 2100 lbs. Solder penetration of the entire cup depth, however, raises the breaking load to approximately 7000 lbs!

Take a look at the edge of this page. Better still, tear it out and join top and bottom to form a cylindrical tube. Now, look. The edge is pretty hard to see. And, so is the soldering clearance in a properly made fitting for copper tubing. The thickness of this page is approximately the same as the maximum clearance of .003" around a $\frac{3}{4}$ " through $\frac{3}{4}$ " fitting. If the clearance becomes just a little more than .001" greater all around, a proper solder bond becomes doubtful. The space is then getting too large for capillary action to carry solder the full depth of the cup. The difference between a NIBCO fitting and one that is too large may be almost microscopic, but it can be the difference between success and failure. Moral: ASK FOR NIBCO!

SEND FOR FREE TESTER

As shown at left, you can quickly determine whether soldering clearance is too great by using the NIBCO JOINT TESTER. If the tip of it can be slipped into the clearance between tube and fitting . . . something is wrong! To obtain your free NIBCO JOINT TESTER, mail coupon below.



NIBCO

NIBCO INC.
Dept. L-6905 Elkhart, Indiana

Please send free NIBCO JOINT TESTER to check soldering clearances between tube and fittings.

name _____

firm _____

address _____

city, state _____

circle 59 on reader service card

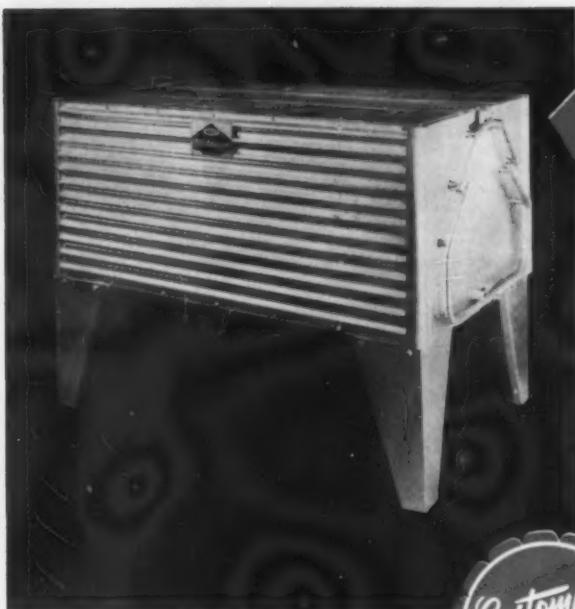
Either Way

ALL SIGNS POINT TO

MARLEY

DriCooler®

AIR COOLED CONDENSERS



DriCoolers are engineered for ABILITY. Vertical blow-through design with diagonally positioned coils delivers greatest cooling capability. Rugged, galvanized structure and heavy duty air-moving equipment assures durability. Single or multi-circuit service in any location, regardless of prevailing winds, means complete adaptability. And the Marley Winter-Control Damper system provides simple, successful operation for one or a dozen circuits during low dry bulb periods—complete controllability.

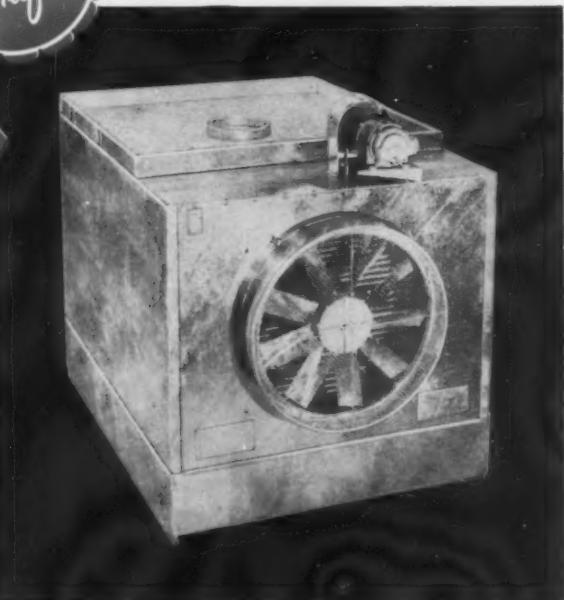


Aquatower®

WATER COOLING TOWERS

Aquatowers deliver more cooling capacity, more job satisfaction to contractors and owners—the results of Marley engineering and experience in more than 100,000 successful installations. That's why they have most efficient air-water balance; most lifetime, nailless filling; heavy-duty mechanical equipment — all contained in a rugged steel casing protected by hot-dip galvanizing after fabrication.

Marley



THE MARLEY COMPANY • KANSAS CITY MISSOURI

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and

ALL SIGNS POINT TO

LAS VEGAS →

← **MIAMI**

→ **MEXICO**

for contractors who install MARLEY



COOLING TOWERS AND DRICOOLERS

Every contractor is eligible to join this owner-education program and be selected to receive an all-expense-paid vacation for two. Get complete information at once from your Marley Man or mail the coupon below.

THE MARLEY COMPANY
222 West Gregory Blvd.
Kansas City 14, Mo.

Send me immediately information on your "Customer Certified" program that offers bonuses for owner education.

Contractor _____

Company _____

Street _____

City _____

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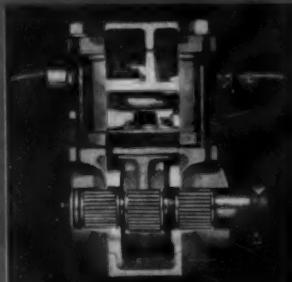
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NEW!

ACID RESISTANT PUMP

FOR DESCALING CONDENSERS
FOR CIRCULATING R-11 WHEN
CLEANING HERMETIC BURNOUTS



ACE MODEL 77 NRS DIAPHRAGM PUMP

Delivers top cleaning efficiency through reciprocating pump surge action! All parts in contact with liquid completely acid resistant! More good news! The Model 77 NRS has no seals to leak and is so designed that it can run dry for hours without damage.

PLUS A COMPLETE LINE OF ACE

1750 and 3450 RPM
CENTRIFUGAL PUMPS

For general service, circulation of hot or cold water, pressure washing or a wide range of other uses, the versatile ACE

ensures you of peak pumping performance, trouble-free operation and easy maintenance. Here are a few of the many

ACE features: John Crane seal; oversized, pre-lubricated, sealed ball bearings; minimum impeller overhang; sealed on plain bearing ends in and out; NEMA standard, continuous-duty motor; and 100% factory testing. Test us with ACE for pumps that are built better to perform better. All these versatile features and truly competitive in price!



ACE

Circle 1 on reader service card

People ON THE MOVE

Copeland Refrigeration Corp. appoints Joseph D. Loveley as coordinator of manufacturing and engineering. He's been assistant chief engineer in Chrysler Corp.'s central engineering in charge of vehicle airconditioning, heating, and ventilating for three years. Prior to that, Loveley was vice president, engineering for Chrysler's Airtemp Div.

Larry Lucas is elected executive vice president of Bastian-Blessing Co. He succeeds A. L. Augur, who was elected president when former president Lewis G. Blessing was named chairman of the board.

John Ross is named manager of research and development department of Metals & Controls Inc., a corporate division of Texas Instruments, Inc.

H. D. Kinsey is elected vice president of Union Carbide Corp. and Paul L. Alspaugh is appointed president of Union Carbide Olefins Co., a corporate division.

Fred B. Akerson succeeds J. E. MacConville as regional industrial sales manager in Atlanta, Ga., for Minneapolis-Honeywell Regulator Co. MacConville becomes sales co-

ordinator for the company's special systems division. Ellery Hall replaces Akerson as director of field education and training for M-H's industrial products group.

Jack A. Hallinan is appointed director of engineering for Kewanee, Ill., plant of American-Standard Industrial Div. Fred J. Robinson is named service manager of the division.

George C. Rayner is promoted from general administrative consultant to assistant to the president of Allied Chemical Corp.'s General Chemical Div. He's been with the division for 30 years.

Silent Automatic Products appoints two district sales managers. James E. Bayne's territory includes New York City, eastern Pennsylvania and New Jersey. Frank J. Sprague covers upstate New York and northern Pennsylvania.

Walter P. Thurber is elected assistant vice president, engineering, of Water Service Laboratories, Inc. He's been chief engineer since 1951 and is replaced by James B. Fullman. New technical director is Dr. Sidney Sussman who will continue as chief chemist.

George J. Finck is promoted from New York district sales manager to product manager, refrigeration for Dunham-Bush, Inc. New representative for the firm in Oregon is K. Gilbert Stahl. His headquarters: Portland.

New St. Louis, Mo., district sales manager for Fulton Sylphon Div., Robertshaw-Fulton Controls Co. is John P. Balke, formerly with Powers Regulator Co. Four sales engineers have been named to these offices: Mack K. Jacobs, Houston, Texas; John C. Dwyer, Baltimore, Md.; and Thomas J. Fisher and J. C. Cate, Knoxville, Tenn.

William A. Lake moves to York-Shipley, Inc. as vice president, marketing. He was manager, distributor sales for Carrier Corp.

L. J. Wing Mfg. Co. promotes John J. Hayes from New York sales manager to field sales manager. Arnold H. Hansen replaces Hayes in New York.

Herbert E. Puttbach is appointed sales manager of Walton Laboratories, Inc. He returns to Walton after serving as manager, service sales for American Pamcor, Inc.

Continued on page 110

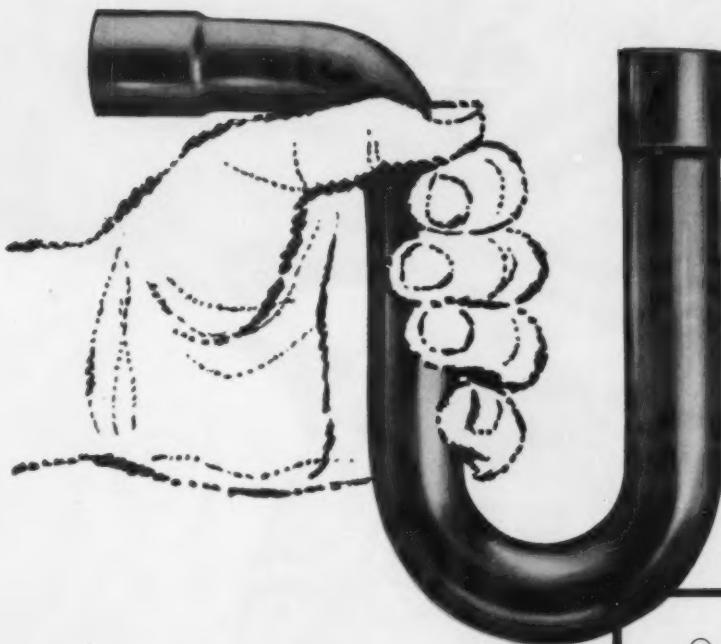


SALES PERSONNEL of Penn Controls, Inc., gathered for a week-long sales conference earlier this year. Representatives from the U.S., Canada, and Penn's export organization participated, as well as management personnel from the firm's three plants.

NEW! FROM MUELLER BRASS CO.

Streamline® ONE-PIECE SUCTION-LINE P-TRAPS

FOR EFFICIENT OIL MIGRATION IN REFRIGERATION AND
AIR-CONDITIONING SYSTEMS*

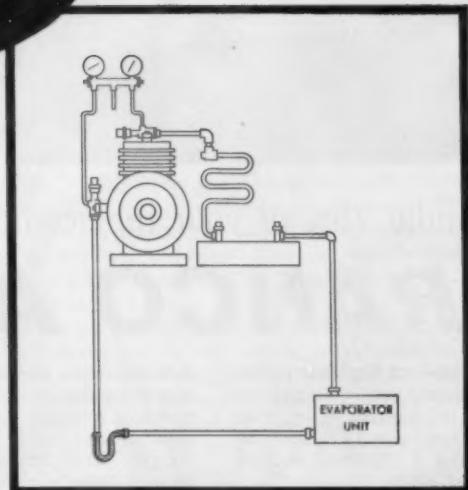


ONE PIECE DESIGN SAVES LABOR AND MATERIALS

The new Streamline P-Trap replaces the cumbersome assemblies of individual fittings with one piece of seamless copper tube, thereby reducing the high costs of labor and materials. The P-Trap is manufactured in 3 popular O.D. sizes; $\frac{1}{2}$ ", $1\frac{1}{8}$ " and $1\frac{1}{4}$ ", and is ready to be soldered into the line. Use this handy P-Trap in your next installation. Your wholesaler has them in stock. For further information, send for Product Data Sheet No. 14.

Streamline wrot-copper suction-line P-Traps, just introduced by Mueller Brass Co., answer a definite demand for an effective method of promoting efficient oil migration in modern refrigeration systems. Today, for example, in many large food markets and other outlets employing refrigeration, compressors and condensers are installed on balconies. Such remote units are likely to have long horizontal suction lines or vertical risers exceeding 3' in height which create the problem of unsatisfactory oil return to the compressor. The installation of a Streamline Suction-Line P-Trap quickly and effectively eliminates this problem because the P-Trap drains the oil from the horizontal runs approaching the risers; the oil then migrates back to the compressor, either as a rippling oil film, a mist, or a transparent colloidal dispersion. Vapor velocity can fall as low as 160 feet per minute and satisfactory oil return can still be achieved when a Streamline P-Trap is installed.

* The need for, and the effect of P-Traps on systems having long horizontal suction lines or vertical risers, is fully discussed in Section 66 of the R.S.E.S. Service Manual.



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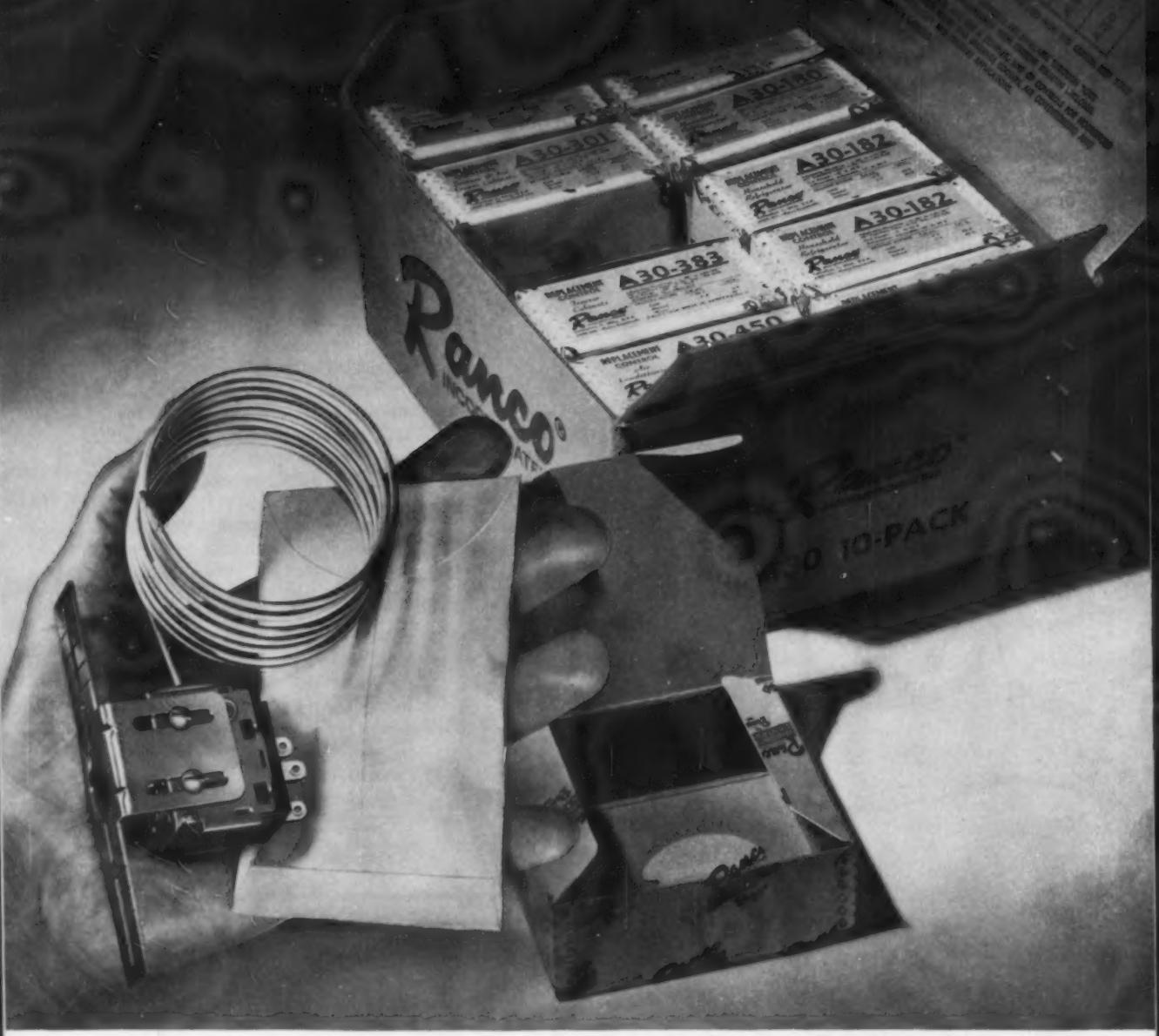


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THE REFRIGERATION & AIR CONDITIONING BUSINESS/MAY 1961



Now handle 75% of your replacement control calls with the handy new

RANCO A30 10-PACK

Put a Ranco 10-Pack Replacement Kit in your truck and you're set to handle 75% of all control calls! This sturdy fibre box holds 10 Ranco A30 controls — the 7 different models you use most often.

Think of the time you save with a Ranco 10-Pack! You have the control you need for fast on-the-job replacement—a versatile assortment in one compact kit. And you can add new controls as needed from your wholesaler's stock.

A30 Controls are easy to install. Mounting brackets adjust for height and hole spacings. Dial shaft extensions are adaptable to any required length. And bulbs are quickly formed from capillary tubes with Ranco's new forming tool.

You'll make more profit with A30 10-Packs . . . service more jobs per day . . . gain greater customer satisfaction. See your wholesaler right away for complete details.



In Canada: Ranco Controls, Canada, Ltd., Toronto 18, Ontario

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Service Clinic FOR CONTRACTORS

A MONTHLY TRAINING GUIDE AND REFERENCE FILE FOR YOUR SERVICE DEPARTMENT

SCALE IN COOLING SYSTEMS

•what causes it

•what it does

•how to remove it

FRED W. J. LIU
director of research, Lester Laboratories, Inc.

MR. CONTRACTOR:

Watch for the Service Clinic every month. The buff-colored pages will make it easy to find. Pull out the complete section and pass it on to your installation and service department. The material in this section is especially selected, written, and edited to help these men do a better job.

FORMATION OF SCALE in water-cooled airconditioning and refrigeration systems has long been a big headache to engineers and servicemen.

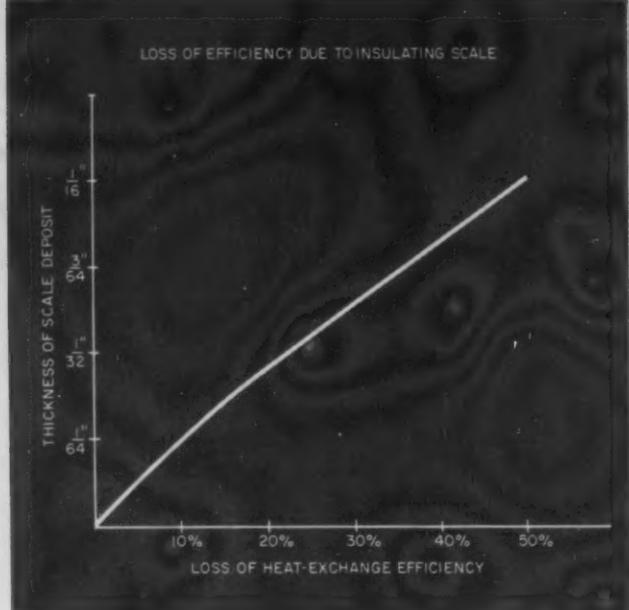
All of them are aware of the problem, but many don't fully understand what causes scale, how much it can cut the efficiency of a cooling system, or how to get rid of it.

Theoretically, scale buildup can occur only where there is mineral hardness or solids in the water used in the circulating system. The scale results from the accumulation and precipitation of the mineral particles from the water. The higher the mineral content, the greater the problem. In some cases the mineral content may run as high as several hundred parts per million.

You could lick this problem by using only demineralized water, but the cost would be prohibitive. In a 100-ton unit approximately 100 gallons of water are evaporated from the cooling tower in every hour of operation. A good sized demineralizer would be required to supply this amount of water continuously. This would substantially boost the installed cost of the system. And the demineralizer itself requires maintenance. This adds to the upkeep of the system.

Continued on page 64

SCALE serves as an effective insulator. Even a thin coating on heat transfer surfaces will sharply reduce the rate of heat transfer. The relationship is shown in this graph.



SERVICE CLINIC

That's why straight well water or city water is still used as the cooling medium for water-cooled refrigeration and airconditioning systems. And since it is not practical to provide water without some mineral content, it is important for you to know something about these minerals and what happens to them in the system.

One of the most common minerals in water is calcium bicarbonate. This is a water soluble mineral formed by the water passing through limestone and other calcium deposits in the soil. When water containing this mineral is circulated over a warm or hot surface, a chemical reaction takes place and calcium carbonate is formed.

Calcium carbonate is insoluble in water, so it is deposited on the warm or hot heat exchanger surface as a hard mineral scale. Most scale is of this type, although it is usually intermixed with magnesium carbonate and magnesium hydroxide, two other insoluble minerals formed in much the same way as the calcium carbonate.

Water with a high silica content forms a silica scale that is difficult to remove. Fortunately, this silica scale mixes with the carbonate scale. So the exact composition of the scale formed in a system varies with the mineral content of the water.

Additional scale is formed by the process of concentration. The 100 gallons of water that is evaporated

each hour from a 100-ton recirculating system leaves behind in the system the mineral content of that 100 gallons. When this water is replaced, the new water adds the same amount of mineral particles.

For example, let's assume that there were 200,000 mineral particles in the system originally. As the 100 gallons of water evaporates, the same 200,000 particles remain. The 100 gallons of new water added would add 20,000 particles, so after one hour of operation the system would contain 220,000 mineral particles.

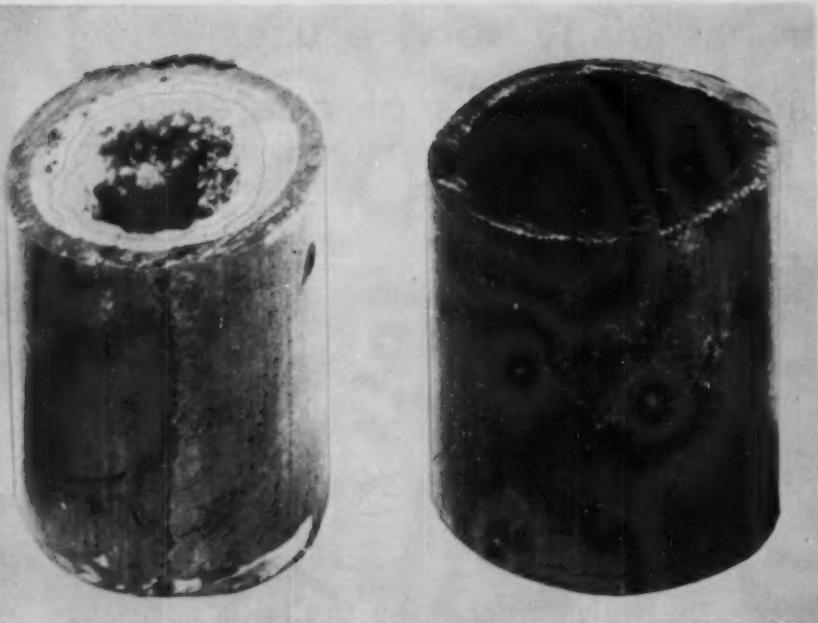
This is why it is necessary to bleed the system constantly. If the bleed rate is not correct, however, an increasing concentration of mineral particles results until these particles precipitate from the water and deposit as scale.

Scale cuts efficiency of system

These scale deposits build up more heavily on the heat transfer surfaces because of the temperature changes. Since scale is a non-conductor of heat, it cuts the efficiency of the heat exchanger just as if it were blanketed with insulation. It has been estimated that a scale coating of only $1/64"$ will reduce heat transfer rate 10%. The heavier the coating, the greater the reduction (see graph).

A further loss in system efficiency results from the reduced flow of water through orifices and pipes that are partially closed by scale (see photograph).

So because of scale, operating costs run higher, equipment does not deliver according to rated ca-



SCALE also reduces efficiency of the system in another way by restricting the flow of water through pipes and orifices. This photo shows how drastically scale can clog water pipes.

pacity, and the system overheats and operates with head pressures that are too high. Unless the situation is corrected by removal of the scale, it can lead to eventual breakdown of the system.

Scale buildups can be prevented by use of demineralized water (impractical for most users because of the expense) or by proper water treatment. In many systems, however, these preventive measures either have not been taken or have not been effective. In these cases the scale must be removed from time to time.

Acid cleaners solve the problem

You can do this by using acid cleaners. Usually there is no need for dismantling the system. Simply circulate the scale remover through the system for a prescribed period while the system is in operation, or else by using the recirculating pump. When you have completed the descaling, drain the system, flush it, and refill it with fresh water.

Most algae and slime are removed along with the scale. If corrosion products are present in the system to an objectionable amount you'll have to use stronger solutions or other cleaners to remove them.

Until recent years, hydrochloric acid (also known as muriatic acid) was the most commonly used scale remover. Many servicemen still use it, as it is inexpensive and, when used in sufficient quantity, is effective. Many others, however, have had an unfortunate experience with it, because it is such a strong acid that it is dangerous to handle. Also, it emits corrosive

and objectionable fumes and corrodes metals in the system. It should never be used without close supervision by experienced men.

More recently, some companies have marketed hydrochloric acids containing inhibitors to reduce the corrosiveness. This still leaves the other disadvantages, however, so a powdered acid scale remover consisting mainly of sulfamic acid has gained some popularity over the hydrochloric acid products.

The sulfamic acid is safer to work with, but sometimes there is a problem of completely and rapidly dissolving it, particularly in cool water.

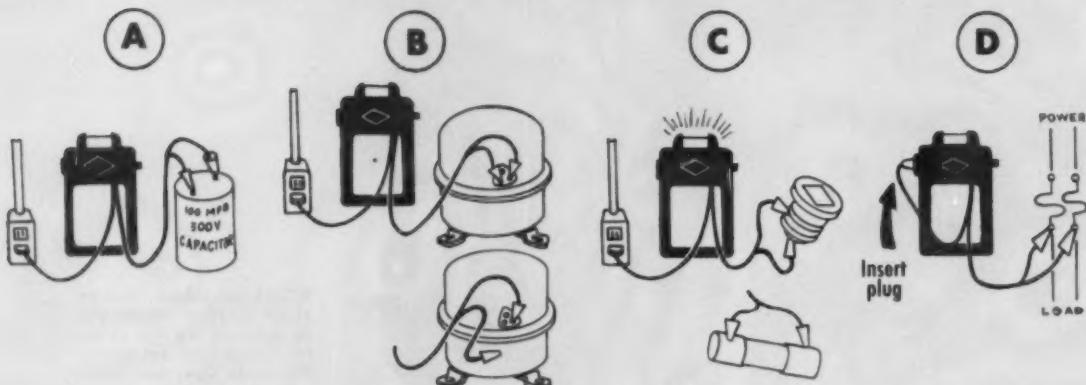
A liquid scale remover containing neither hydrochloric nor sulfamic acid also is available. It is claimed to eliminate the problem of fumes and the danger to the men handling it. It readily mixes with the water for fast action. Because it is relatively non-corrosive, it does not require close supervision, and can be left in the system unattended for longer periods of time.

Remove scale at start of season

It is particularly important to remove scale accumulations at the beginning of the airconditioning season, if you want to increase the chances of trouble-free operation of the system. In areas where mineral content of the water is high, descaling often is required during the season as well.

If you understand the cause of scale, the effect it has on the system, and how to correct the problem, you will be able to explain to your customers the need for proper maintenance of their equipment ♦

Capacitor tester has many service uses; here are some ABC's of operating it



Using Watsco's new "Cappy" makes capacitor testing both simple and inexpensive. This electronic instrument tests all types of capacitors and condensers (both ac and dc) and all voltages.

You just plug the tester into a 115 v. ac or dc outlet, making sure resistors and wiring have been removed from the capacitor. Attach the alligator clips to capacitor terminals and operate the switch.

If capacitor is good, indicator light will flash on, then gradually dim and go out. The longer the light remains on, the greater the microfarad capacity of the unit being tested.

To double check, operate switch back and forth.

Here are some practical applications for the tester:

Illustration A

For testing capacitors — If no light appears when switch is operated, capacitor is *open*. If indicator light remains on, capacitor is *shorted*. If light wavers, capacitor is *leaking*.

A grounded capacitor can be detected by testing from either terminal to the metal case. If it's *grounded*, light remains on.

When testing new 115 v. motor starting capacitors of 100 microfarads capacity and up, the light may

remain on up to 15 minutes. This only indicates that the electrolyte fill has never been electrically charged, not that capacitor is defective.

WARNING: Be sure to discharge all capacitors after testing. You can do this by shorting across both terminals with a screwdriver.

For testing dc or polarized condensers — Test is same as capacitors. If light remains on, reverse polarity by operating switch. If light still remains on, capacitor is *shorted* and should be replaced.

Illustration B

For grounded wiring test — Light will appear if winding is *grounded*. If it's *open*, there'll be no light.

Illustration C

For testing fuses — Light will glow if fuse is *good*.

Illustration D

For line voltage test — Insert plug as shown; 220 v. appears *brighter* than 115 v.

There are many other uses for this instrument. These include continuity testing of electric motors and household electric appliances. ♦

Look for these Service Clinic articles in coming issues:

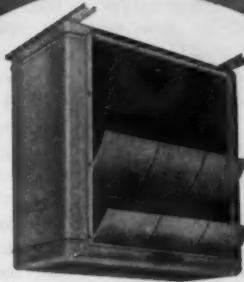
- How to test for hermetic burnouts
- Proper evacuation of cooling systems
- How to clean electric motors
- How to use a snap-around volt-ammeter

the companion to Thermobank...

KRAMER THAW[®] SYSTEM

A NEW AUTOMATIC HOT GAS DEFROST SYSTEM

*for applications where
LOW FIRST COST
is the major consideration*



One fan evaporator with heat exchanger



Metering accumulator with brackets

If low first cost is the major factor, the new Kramer THAW SYSTEM offers more than any competitive system. (For sharp freezing loads, or where compressor is outdoors, Thermobank is recommended.)

- No compressor overloading with hold-back valve.
- Faster defrosting because more heat is available.
- Positively cuts liquid return to the compressor.
- Has the largest liquid accumulator.
- Foolproof metering device.
- No clogging with removable strainer.
- Oil problems eliminated by gravity drain.
- No unnecessary defrost cycles.
- Heated copper drain pan.
- Double pan to protect heating coil.
- Aluminum casing on evaporator.



Removable Strainer



Timer



Hot Gas Solenoid Valve



Hold-Back Valve



Hot Gas Strainer



Check Valve

Write for Catalog T-480

KRAMER TRENTON CO., Trenton 5, N. J.

47 YEARS OF CONTINUOUS ACHIEVEMENT IN HEAT TRANSFER
circle 43 on reader service card

THE REFRIGERATION & AIR CONDITIONING BUSINESS/MAY 1961

Contractor-Dealer ACTIVITIES

Licensing, bonding of contractors urged by UA's Peter Schoemann

Public licensing and bonding of airconditioning and refrigeration contractors, enforced by law or ordinance, was advocated by Peter T. Schoemann, general president of the United Association (AFL-CIO).

Schoemann proposed this system as a solution to the problem of the unqualified and inexperienced contractor in his talk before the Refrigeration and Air Conditioning Contractors Association national convention.

"I believe both the public and the manufacturer, as well as competent contractors and our local unions, are entitled to a little real protection under law," Schoemann declared.

The union president does not see any law or ordinance as being a difficult hurdle which the contractor must overcome before he could obtain a license.

"Once a man is licensed," emphasized the speaker, "he must be made to toe the mark. The law should require him to keep

on file an adequate bond to protect the public in case of faulty or poor workmanship."

Two other suggestions for this law were:

- A board or similar authority to whom complaints could be made and, after investigation, by whom licenses may be revoked because of irregularities.

- Strict maintenance of standards among contractors to protect the industry from unqualified airconditioning and refrigeration men.

Schoemann assured his listeners he was not suggesting a licensing system for refrigeration and airconditioning mechanics. He believes that the joint training program, sponsored by the union and the contractors, would eventually operate to solve the problem of unqualified journeymen.

He indicated that a committee could be set up by national RACCA leaders for developing a model law or ordinance which local RACCA chapters could use or adapt for local use.

Schoemann assured RACCA of his union's cooperation toward securing a licensing program and promised support of local unions in achieving passage of an ordinance by local chapters.



A CHECK FOR more than \$200,000 is deposited in an investment trust fund at the Bank of America in California. This check represents pension fund monies established for union employees working in the airconditioning and refrigeration industry in Southern California. Making the deposit are Gene Ballard (left), business manager of Refrigeration Fitters Branch Local No. 250, and H. P. Schuch (center) of the Southern California Refrigeration and Air Conditioning Contractors Association. Bank officer is James M. Garrison.

tributed," said Carl Fehrenbach, Jr., president. "Our equipment is considerably more economical, too."

Regis H. Krug, veteran of 17 years with Greyhound Lines, has joined Thermo as sales manager for bus airconditioning.

BOOK REVIEW

Title: Mechanical Estimator's Guide, 1960 Edition, 56 pages.

Editor: John Gladstone.

Publisher: Technical Guide Publications, Inc., Miami, Fla.

Price: \$6.00.

Designed for airconditioning dealers and contractors, mechanical contractors, consulting engineers, and wet and dry cooling specifiers, this guide provides up-to-date price lists of thousands of items in the cooling, ventilating, and piping fields. Speed estimating methods are given, along with estimating data with check figures. Contains close out figures for more than 150 examined jobs, available for budget figures and projected preliminaries. A total of 14 tables, including duct weights, residential cooling zones, and warranty labor allowances.

Utah RACCA chapter elects Hanks president

President of the newly-organized Utah chapter of Refrigeration and Air Conditioning Contractors Association is R. Jack Hanks of Moore Butcher Supply Co.

Other officers include Robert F. Poulsen, Central Service, Co., vice president, and Robert N. Roser, Louis A. Roser Co., treasurer.

Newark distributor moves into bus, truck cooling

Thermo Equipment Corp., Newark, N.J., has entered the manufacturing field. It will continue to distribute refrigeration and airconditioning units and parts motor vehicles, but plans to concentrate its sales efforts on its own equipment.

"We have developed airconditioning and refrigeration units for buses and trucks that are far superior to anything we have ever dis-

Montreal distributor expands Carrier line

Howe Equipment of Canada Ltd. has expanded its line of Carrier equipment up to 200 tons capacity.

A complete line of Carrier equipment and parts will be available from Howe's inventory.

how do distributors rate **NOR-LAKE** refrigeration products?

66

NOR-LAKE GETS A's IN SCHOOL SALES!



99

... says J. A. Kolbe, of John G. Kolbe Company, Richmond, Va.

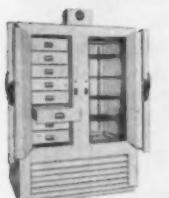
"It's much easier to sell dollar-conscious schools when our product has both variety and quality—like NOR-LAKE. NOR-LAKE'S quality line means selling flexibility—allows us to compete for sales effectively in both institutional and commercial fields.

"Then too, NOR-LAKE'S 'Fine-Line' appearance is backed up by rugged design based on years of refrigeration experience. Our success in the school market—where NOR-LAKE'S ruggedness and reliability is so important—has returned double dividends to us. Our experience shows that NOR-LAKE means savings in time, trouble and service calls. We get satisfied customers (the most important sales asset for any dealer).

"Now you know why we feel NOR-LAKE products rate A's for quality sales. Naturally Kolbe Company is proud to display and sell NOR-LAKE'S line of refrigeration products, and we expect to continue this pleasant association for many more years."

*John G. Kolbe Company is one of the South's largest suppliers of equipment for schools, hotels, and restaurants.

NOR-LAKE'S "FINE-LINE" IS A FULL LINE



biological refrigerators



refrigerators



walk-ins



freezer-refrigerator combinations



freezers



bottle coolers



ice cube makers
circle 60 on reader service card



direct draws

Write today for information concerning NOR-LAKE sales opportunities in your area.



NOR-LAKE, inc.
Second & Elm,
Hudson, Wisconsin,
Dept. 205

AIR CONDITION MORTUARY CHAPELS AND PARLORS AT LOW COST!

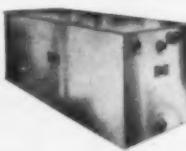


Application: Striffler's Mortuary in Columbus, Georgia.
15 Ton Load—3 HP Condensing Unit.

NO COSTLY ALTERATIONS!

Designed specifically for peak loads of short duration, the DOLE *Ice-Cel* System is the answer to the most efficient and most economical air conditioning of mortuaries. In the above installation three funerals a day have been handled easily, leaving a sufficient reserve capacity for special uses. The compact construction of an *Ice-Cel* unit permits easy, convenient installation in the least amount of space. Original investment is small. Operating costs are low.

In air-conditioning a remodeled or new mortuary, it will pay you to check the advantages of a DOLE *Ice-Cel* Air Conditioning System.



LOOK FOR THIS SIGN  FOR BETTER REFRIGERATION

DOLE REFRIGERATING COMPANY
5942 NORTH PULASKI ROAD, CHICAGO 46, ILLINOIS
103 PARK AVENUE, NEW YORK 17, N.Y.

DOLE REFRIGERATING PRODUCTS LIMITED
OAKVILLE, ONTARIO, CANADA

Write for more information on the DOLE *Ice-Cel* unit. No obligation, of course.



***Ice-Cel* UNITS**
THE BEST IN AIR CONDITIONING

circle 26 on reader service card

70

USEFUL Literature

POWDERED acid cleaner for removing scale deposits is featured in Bulletin HSP-940, Hagan Chemicals & Controls, Inc. Two closeup cross-section photos of scale deposits and one of scale dissolving in water, and drawings of methods of using the cleaner also featured. Advantages and special applications of the cleaner wind up the bulletin.

circle 206 on reader service card

THE R FACTOR in insulation is explained in Form 4015, published by National Gypsum Co. The booklet also shows how various insulation products should be specified and installed and gives details of vapor barrier, ventilation, and amount of insulation necessary for a given installation. Also included is cost estimating data and technical notes.

circle 207 on reader service card

BANISH HUMIDITY with a Whirlpool Corp. dehumidifier is the claim of Form 6506. The release has photos referring to the automatic humidistat, portability, and removable container. Also specs on the product and its cabinet as well as a small dimensional drawing.

circle 208 on reader service card

"**WHAT'S THE DIFFERENCE** in polyethylene pipe?" is the question both posed and answered in a pamphlet released on the product by Union Carbide Plastics Co. Div., Union Carbide Corp. The firm's "Bakelite" pipe's applications, installation procedures, and selection for various uses are described. Also included are a comparison of typical properties and cost of materials vs. other types of pipe.

circle 209 on reader service card

FOR BIG JOBS, Bulletin 262-B says to use small valves made by Controls Div., American-Standard. There are several product photos, cutaway views, a direct replacement chart, and spec charts on three types of valves. Also explained is a simplified unit system to order and identify the fourth type of valve.

circle 210 on reader service card

TROUBLE-FREE installation of roof exhaust fans is yours when you use the all-aluminum thermal-acoustic curb, says Bulletin TA-101 of Davidson Fan Co. Eight featured advantages of the curb are given, as well as a fairly detailed drawing, a cross-section view, and a dimension schedule of the curb.

circle 211 on reader service card

TWO BULLETINS, FD-1 and FD-2, on "Freon 11" talk about how the product solvent cleans refrigeration systems and how it can be recovered. Both releases are issued by "Freon" Products Div., E. I. du Pont de Nemours & Co., and each has both actual and exploded product photos and parts lists. FD-1 also has a detailed cleaning procedure.

circle 212 on reader service card

ALL NEW FOR YOU is one of the sub-titles of a new brochure (Form JS-328P) on electric ducted warm air heating. It's from Janitrol Heating and Air Conditioning Div., Midland-Ross Corp., and features horizontal flow, upflow, and downflow electric forced warm air furnaces. There are photos, construction and design features, a list of reduced clearances, installation accessories, and standard equipment. Also included are charts on evaporators, heat output correction factors, engineering data, and roughing in dimensions.

circle 213 on reader service card

ONE MAN can trace cables 10 times faster with an "Amprobe" cable tracer is the claim of Catalog CTC-5 from Amprobe Div., Pyramid Instrument Corp. It contains many sketches of how the tracer works and illustrates these advantages: 1-man method, eliminates groping, professional approach, panel light identifies conductors, accommodates all wire sizes, sturdy construction, compact carrying case. There is also a page on the product's specifications and dimensions.

circle 214 on reader service card

APPLICATION INFORMATION and mechanical features are in Century Electric Co.'s release on integral horsepower vertical motors. Besides these features, it contains six photos, dimensional data, and schematic drawings that highlight the motors' components.

circle 215 on reader service card

THE PACESETTER in the 1960's is airconditioning equipment by Drayer-Hanson Div., Hi-Press Air Conditioning of America, Inc. Form GAC has everything from fan-coil units to cooling heating coils, with photos, applications, and specs for each.

circle 216 on reader service card

A PRODUCT CATALOG for 1961 on ice storage bins for automatic ice machines has been published by Roy Follett Corp. It includes spec sheets and application data sheets for the ice machine used. Each of the latter has an equipment selector chart and dimensional line drawing of selected installation.

circle 217 on reader service card

CONTAINING battery drain charts, installation information, and other equipment details, Bulletin ECR-870 from Communication Products Dept., General Electric Co., discusses the new "Pacer" line of compact, 2-way radio equipment.

circle 218 on reader service card

Continued on page 72



FASTER WAY to apply insulation, helps SHRINE OF THE IMMACULATE CONCEPTION

The largest Catholic cathedral in the United States built by John McShain Inc., utilized Stic-Klip Fasteners and Adhesive for insulating its vast heating and air-conditioning duct installation. When insulation materials require fast, labor-saving, positive, permanent anchoring, plus eliminating the necessity of drilling or punching, you can't go wrong by using proven, tested, Stic-Klip Fasteners and Adhesive.

Stic-Klip® MANUFACTURING CO.
54 Regent St., Cambridge 40, Mass.

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THE REFRIGERATION & AIRCONDITIONING BUSINESS/MAY 1961

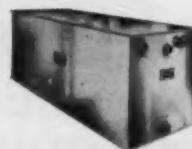


Ice-Cel Installation: Third Church of Christ Scientist, St. Louis, Missouri

FOR HEAVY LOADS OF SHORT DURATION

Many of America's finest churches depend on DOLE *Ice-Cel* units to provide the ultimate in air conditioned comfort for their congregation. Since refrigeration is stored in the form of an ice bank, smaller refrigeration equipment can operate during periods when cooling is normally not required. As a result, capacity is available for heavy loads when needed. Zoning for areas of lesser requirements but more continuous usage, such as the pastor's study, parish hall, class rooms, etc., is easily handled by the same equipment.

Charging of the *Ice-Cel* can be accomplished at any time. A small condensing unit can operate all day and most of night if desired. Ideal for offices, stores, theaters, auditoriums and cafeterias.



LOOK FOR THIS SIGN  FOR BETTER REFRIGERATION

DOLE REFRIGERATING COMPANY
5942 NORTH PULASKI ROAD, CHICAGO 46, ILLINOIS
103 PARK AVENUE, NEW YORK 17, N.Y.

DOLE REFRIGERATING PRODUCTS LIMITED
OAKVILLE, ONTARIO, CANADA

DOLE engineers will help you plan the air conditioning system to fit your needs. Write for Engineering Catalog BAE.



Ice-Cel UNITS
THE BEST IN AIR CONDITIONING

circle 27 on reader service card

circle 46 on reader service card

NEW AIR-CONDITIONING AID



Restore the
original performance
of your
air-conditioning

Keep air-flow coils new-clean with METALENE

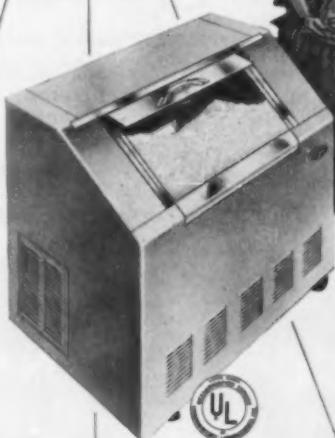
- Non-flammable, non-toxic.
- Non-corrosive, prevents rusting.
- Approved safe for food and drug plants.
- Non-volatile, harmless to paint.



Write for descriptive literature to
LESTER LABORATORIES, INC.
P. O. Box 4897 Atlanta 2, Georgia
Some distributorships and manufacturers agents territories still available

ROSS temp

FLAKED ICE MACHINES



circle 72 on reader service card

USEFUL Literature

Continued from page 71

NOT A WINDOW UNIT, but designed specially for through-the-wall applications, is a new air conditioner publicized by York Div., Borg-Warner Corp., in a new release. There's a specifications chart on the capacity, dimensions, compressor, evaporator, condenser, and fans. Also included are photos and captions of individual components of the unit.

circle 219 on reader service card

THIS BULLETIN, No. DB7-102, contains much data on various fans, ventilators, and unit heaters. It is from Ilg Electric Ventilating Co. and its illustrations, ratings, and specs cover direct-connect airfoil centrifugal fans, propeller and centrifugal roof ventilators, wall-mounted and square panel propeller fans, and steam, hot water, electric, and gas-fired unit heaters. There are also illustrations and capacities of the Type B direct-connected and the Type FU belted "Util-A-Set" centrifugal fans.

circle 220 on reader service card

PROTECT TEMPERATURES even when a door is continuously open with an "Air Isolator", says a specification sheet published by Jamison Cold Storage Door Co. The "Air Isolator" is an air curtain closure that screens out heat, cold, humidity, dust, odors, and insects and opens doors to unlimited traffic for moderate temperatures 15 F above. The release has an application photo and drawing in addition to two schematic views of the product. There is also a typical specification sheet as well as a spec table.

circle 221 on reader service card

easier to sell because they are "summer rated"

"Summer rated" means Ross-Temp production will not "fall down" on hot summer days when ice is needed most. The capacity of each Ross-Temp unit is based on operating in 90° air and with 70° water and not the lower 70° air and 60° water so common in the industry. Ross-Temp owners are so much better satisfied that their recommendations lead to other sales for you.

OTHER FEATURES: Waist-high Ice Bin . . . Fits under counters or in equipment islands . . . Only one moving part in freezing chamber . . . Costs only a few pennies a day to operate . . . Choice of 20 models. Every Ross-Temp Flaked Ice Machine is fully checked and tested at the factory.

SEE OUR EXHIBIT:
BOOTHES 1744 & 1746
N.R.A. SHOW

Write or wire for
details on how you
can profit more with
Ross-Temp.

CAPACITIES: 150, 250, 400
and 525 Pounds

ROSS-TEMP, INC.

Subsidiary of Schneider Metal Manufacturing Co.
1817 South 55th Ave., Chicago 50, Ill.

MAY 1961/THE REFRIGERATION & AIR CONDITIONING BUSINESS

circle 47 on reader service card

COMPLETELY DESCRIBED in 4-page Bulletin D6 of McIntire Co. is the line of flanged demountable shells with replaceable cartridges for permanent liquid line service. Simplified selection chart shows dimensions, water and drying capacities, and tonnage ratings on sizes 1 to 100 ton capacity systems.

circle 222 on reader service card

EACH OF NINE ADVANTAGES of zone control baseboard heating is illustrated on a 4-color poster available from Edwards Engineering Corp. The poster, which measures 27 x 21", promotes the advantages and benefits of zone control heating. The advantages described are: smaller fuel bills; no dust; evenly distributed wall warmth; all room areas utilized for furniture; individual thermostatic control of all zones; no space needed for registers; and small equipment size that leaves more room space.

circle 223 on reader service card

DEFINITE PURPOSE contactors and starters are the subjects of General Electric Co.'s Bulletin CEA-7316. New 30- and 40-amp contactors and starters, as well as 50- and 60-amp sizes, are pictured and discussed along with overload relays, custom control panels, and step starting accessory available. Outline drawings and dimensions are shown for both open and enclosed starters and contactors along with a page of data on loads, coils, outline numbers, wiring diagrams, and weights of devices. There are lists of nomenclature and ratings for the line.

circle 224 on reader service card

PACKAGE UNITS "satisfabricated" by Governaire Corp. are discussed in a release on Model SCAC. There are numerous product photos, charts and sheets of diagrams and dimensional data, and two tables of capacities and other specs. Included in the booklet are separate sheets on a copper-fitted evaporative condenser and more information on the SCAC.

circle 225 on reader service card

New - Safe

SCALEX

CONTAINS NO

HARMFUL
ACIDS



Safe HARD WATER SCALE REMOVER

SCALEX, the safe, non-toxic controlled acid, liquid scale remover and air conditioning system cleaner, reduces high head pressure rapidly and completely descales the entire system wherever water flows. SCALEX removes all internal scale safely, without damage to aluminum, copper, brass or ferrous metal or non-metallic parts. SCALEX can be used without damage while the system is in normal operation; there are no acid fumes. No neutralizer is needed. SCALEX removes slime and algae instantly.

SCALEX Inhibitor Z is used together with SCALEX when galvanized metal is to be descaled.

NO
ACID
FUMES

SCALEX IS SAFE TO USE
SCALEX IS EASY TO USE
SCALEX IS ECONOMICAL
SCALEX DOES THE JOB

DILUTE
33 to 1



Write for descriptive literature to
LESTER LABORATORIES, INC.
P. O. Box 4897 Atlanta 2, Georgia

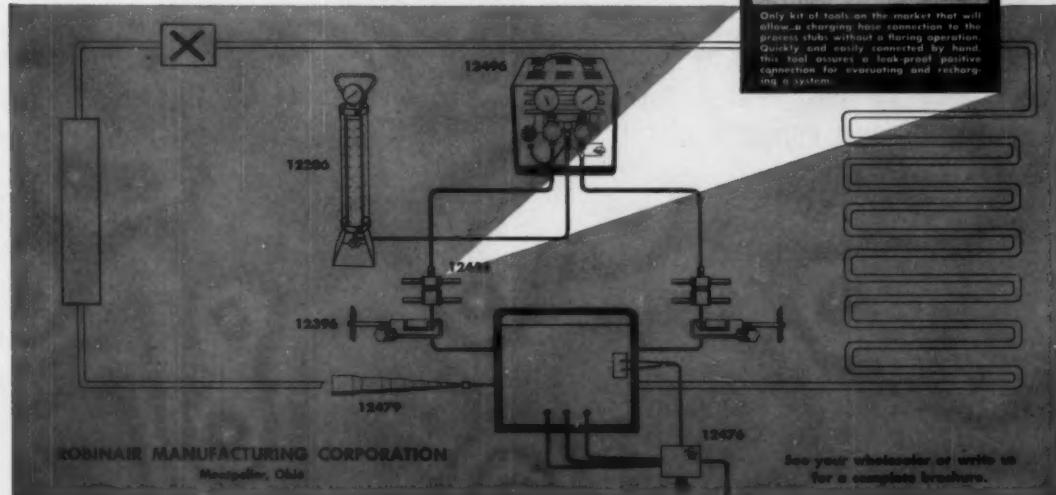
Some distributorships and manufacturer's agents territories still available.



factory approved tools for exploding component change market



Only kit of tools on the market that will allow a charging hose connection to the process stubs without a flaring operation. Tools are easily connected by hand. This tool assures a leak proof positive connection for evacuating and recharging a system.



circle 71 on reader service card

THE REFRIGERATION & AIRCONDITIONING BUSINESS/MAY 1961

Drayer-Hanson Air Conditioning

252 TIMES!



New 29-story Tower
AND EXHIBIT HALL
AT SAN FRANCISCO'S FAMED
Fairmont Hotel

D-H'S POPULAR SPOTAIRE LRC'S SOON
IN ALL INDIVIDUAL ROOMS & SUITES!

CREDITS: ARCHITECT: Mario Gaidano, AIA. ENGINEER:
Edward Hill & Associates. AIR CONDITIONING CONTRACTOR:
James A. Nelson Company. D-H SALES AGENT:
E. C. Cooley Company.—All of San Francisco.

Request Brochure 130-01



DIVISION OF
HI-PRESS AIR CONDITIONING OF AMERICA, INC.
3301 Medford Street, Los Angeles 63, California
(Cable: Cliconi, Los Angeles)

circle 28 on reader service card

BUSINESS Trends

Continued from page 26

Final 1960 ARI figures reveal gain of 9% over '59

Manufacturers' shipments of unitary airconditioners, released by Air-Conditioning and Refrigeration Institute, showed a gain of 9% in 1960 over 1959.

Total for 1960 was 312,380 units, excluding coils, compared with 285,935 the year before. ARI estimates that its figures represent 90% of the industry total. Room units are not included in the totals.

Tables below show 1959 vs. 1960 figures, as well as a breakdown by type of equipment for the two fourth quarters.

Product description	Fourth quarter 1960	1959	Change over last year
AIRCONDITIONERS¹			
Self-contained	11,470	13,070	-12.2%
Remote-condenser	1,047	787	+33.0%
Refrigeration chassis	453	249	+81.7%
YEAR-ROUND AIRCONDITIONERS²	2,310	1,547	+49.3%
HEAT PUMPS³			
Self-contained	6,925	6,650	+4.1%
Other than self-contained	2,823	2,683	+5.2%
SPLIT SYSTEMS	25,718	26,505	-2.9%
Airconditioning condensing units	25,718	26,505	-2.9%
Airconditioning coils with blower	5,822	6,684	-12.9%
Airconditioning coils without blower	21,746	27,127	-19.8%
GRAND TOTAL⁴	50,746	51,491	-1.5%

Product description	1960	1959	Change over last year
AIRCONDITIONERS¹			
Self-contained	78,880	79,352	-1%
Remote-condenser	4,288	5,444	+15%
Refrigeration chassis	1,471	2,188	-33%
YEAR-ROUND AIRCONDITIONERS²	10,890	11,181	-3%
HEAT PUMPS³			
Self-contained	27,841	22,888	+22%
Other than self-contained	13,214	12,279	+8%
SPLIT SYSTEMS	173,796	152,581	+14%
Airconditioning condensing units	173,796	152,581	+14%
Airconditioning coils with blower	41,824	35,183	+19%
Airconditioning coils without blower	134,084	107,198	+23%
GRAND TOTAL⁴	312,380	285,935	+9%

¹Except window and wall types

²Except heat pumps

³Except room airconditioners

⁴Excluding coils

CONDENSED SUMMARY BY SIZE

SIZE	JANUARY-DECEMBER, 1960 (12 months)			Percent of Change from 1959	
	By Condenser-Type		Total Units		
	Air or Evap- oratively Cooled	Water- Cooled			
Under 27,000 Btu/hr	51,046	175	51,221	+11%	
27,000-32,999 Btu/hr	24,571	41	24,612	+15%	
33,000-41,999 Btu/hr	90,966	6,267	97,233	-3%	
42,000-51,999 Btu/hr	37,874	5,248	43,122	+55%	
52,000-64,999 Btu/hr	34,341	12,989	47,330	+6%	
65,000-96,999 Btu/hr	16,597	6,895	23,492	+6%	
97,000-114,999 Btu/hr	7,626	5,126	12,752	-0-	
135,000-184,999 Btu/hr	3,008	2,664	5,672	+17%	
185,000-249,999 Btu/hr	1,256	2,201	3,457	+30%	
250,000-312,999 Btu/hr	231	1,343	1,574	-5%	
320,000-379,999 Btu/hr	231	917	1,169	-0-	
380,000 Btu/hr and over	109	657	766	+142%	
TOTAL	267,857	44,523	312,380	+9%	



There are 20 different brands of in-line refrigeration driers on the market today. ANSUL is introducing No. 21. We're entering this crowded and highly competitive field for just one reason: the new ANSUL "System Boss" drier will do a better drying job at a lower cost than any of the others.

The "System Boss" makes it possible for you to use a smaller-sized—and consequently less expensive—drier than many of those you've used in the past. It's possible because improved flow characteristics reduce pressure drop . . . because of a better filter arrangement . . . because of a superior desiccant. The "System Boss" is available in all popular sizes from better refrigeration wholesalers everywhere.

ANSUL

ANSUL CHEMICAL COMPANY
MARINETTE, WISCONSIN

**Dealer-Distributor
APPOINTMENTS**

Delavan Mfg. Co.—*O'Brien Steam Specialty Co., Inc.*, Syracuse, covering upstate New York; *Hovey Spray Equipment Co.*, Philadelphia, covering eastern Pennsylvania, southern New Jersey, Del-

aware, Maryland, and Washington, D.C.; *King & Shepherd, Inc.*, New York City, covering that city and northern New Jersey.

Connor Engineering Corp.—*J. W. Cherry Co.*, Shreveport, La.

Ace Pump Corp.—*George W. Wilson*, Park Ridge, Ill., covering northern Illinois, northern Indiana, Wisconsin, Minnesota, and Iowa.

Fedders Corp., Refrigeration Appliances Div.—*Electrical Distributing, Inc.*, Portland, covering Oregon and parts of Washington; and *Steve Jordan, Inc.*, Wichita, Kan., in that area.

Union Carbide Development Co., Div. of *Union Carbide Corp.* for cube air filters—*Bell & Eiss, Inc.*, Minneapolis, covering Minnesota, North Dakota, South Dakota, and parts of Wisconsin; *Ed Gifford & Co.*, Milwaukee, covering parts of Wisconsin.

CRS Industries, Inc.—*Air Equipment Inc.*, Milwaukee, Wis.; *Norman S. Wright & Co.*, Sacramento, for northern California and northern Nevada; *Manufacturers' Sales Co.*, Kansas City, Mo., for western Missouri and eastern Kansas; and *B & V Sales Co.*, St. Louis, for eastern Missouri and southern Illinois.

Savage Ice Cream Cabinet, Div. of C. V. Hill & Co., Inc. for chest and merchandising cabinets—*Ted Burton Co.*, Roanoke, covering western Virginia and some counties in West Virginia.

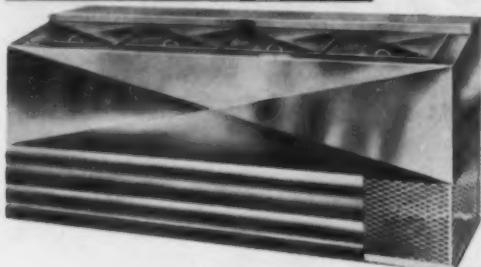
Halstead & Mitchell Co.—*William F. Albern*, Buffalo, N.Y., and *George L. Jackson Co.*, Phoenix, Ariz.

Allied Metal Hose Co.—*Louis H. Hein Co.*, West Conshohocken, Pa., covering the Philadelphia area.

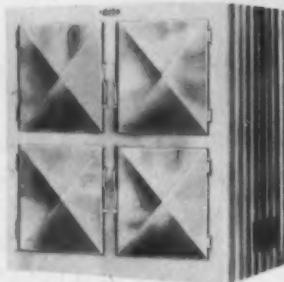
Carrier Air Conditioning Co., Carrier Corp.—*Duckett Distributing Corp.*, Boston, covering that city, Rhode Island, and eastern Massachusetts; *Hausman Steel Co.*, Toledo, Ohio, for the greater Indianapolis, Ind., area; and *Connecticut Air Conditioning Co.*, West Haven, Conn., to include parts of Connecticut and Massachusetts.

Gibson Refrigerator Sales Corp., Sub. of Hupp Corp.—*G. P. Derickson Co.*, Minneapolis, for 67 counties in Minnesota and 23 in Wisconsin.

FLO-COLD



2 Temp. 2 Compr.
Stainless Steel or
Silvertone Baked,
with Stainless
Steel inside. Any
size. Custom built.

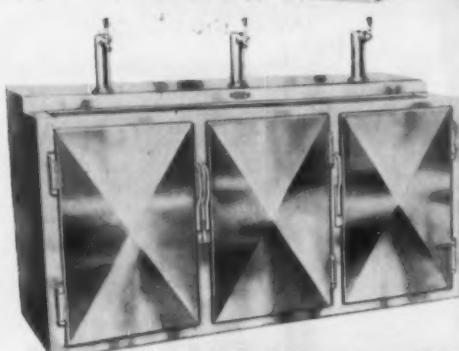
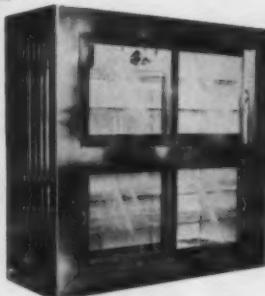


STAINLESS STEEL EQUIPMENT

DRINKMASTER

Bottle Cooler
& Ice Cuber

4 to 10 ft. lengths



FLO-COLD Reach-ins
Sliding Glass Doors on brass
rollers. Remote or with comprs.

DIRECT DRAW BEER DISPENSERS

2 HB / 3 HB / 4 HB / 5 HB

DEALERS WANTED . . .

"A Case of Cool Judgment" Ask the man who owns one

United Friguator Engrs.

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Menominee
Michigan
U.S.A.



The duct that delivers air without noise

In air conditioning and warm air heating "quiet operation" has always been an expensive luxury. With conventional sheet metal duct systems, quieting fan and compressor noise or the "booming," caused by metal duct expansion and contraction, is a time-consuming and expensive job.

But with Armaglas Duct—the round prefabricated glass fiber duct system now available from Armstrong—the luxury of quiet operation is "built in"—still a luxury but no longer expensive.

Armaglas Duct is a natural sound trap. Its glass fiber walls "soak up" airborne fan and compressor noise for remarkably quiet operation. And since Armaglas Duct is non-metallic, it completely eliminates the "booming" or "canning" that's a common annoyance with sheet metal duct systems. This new material offers other important advantages, too.

Armaglas Duct is an all-in-one duct. It handles air efficiently. Uniform and permanent thermal protection is built in, because Armaglas Duct is preformed of thermally efficient glass

fiber insulation in a uniform density and thickness. Vapor barrier is built in, too, in the tough plastic casing that forms the outer skin of Armaglas Duct. Duct, insulation, vapor barrier, and effective noise control are all combined in this one material.

Armaglas Duct comes ready to install. No folding—no preassembly is required.

It's easy to install. The six-foot sections go together fast, with simple metal sleeve connectors and pressure-sensitive tape at the joints. Job experience has shown installation time savings of up to 50% with Armaglas Duct. And this remarkable new system, with its many built-in values, costs no more installed than standard sheet metal duct plus insulation.



For a free booklet with complete information on Armaglas Duct, write Armstrong Cork Company, 4405 Roth Avenue, Lancaster, Pennsylvania.

Armstrong ARMAGLAS DUCT

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THE REFRIGERATION & AIRCONDITIONING BUSINESS/MAY 1961

BENDIX-WESTINGHOUSE BACKS YOU UP WITH STRONG FIELD SUPPORT

Certainly, you'll agree. Next to product quality—few factors are more important to a manufacturer of refrigeration equipment than service support from his supplier. Here's the strong field support program Bendix-Westinghouse offers:

OVER 200 AUTHORIZED WHOLESALERS FROM COAST TO COAST:
This means—no matter where your customers are located, no matter where your installations are made—an authorized Bendix-Westinghouse wholesaler is close at hand.

COMPLETE ON-THE-SPOT REPLACEMENT INVENTORIES: Our nation-wide wholesalers' network maintains complete inventories of motor compressors, condensing units, and replacement electrical components.

EXPERIENCED ENGINEERING AND APPLICATION ASSISTANCE: Available from our regional managers located in major cities throughout the U. S. and Canada. These representatives use modern instruction devices and are well-qualified either to render on-the-job assistance or to conduct educational meetings.

Our field support is just one more reason why Bendix-Westinghouse is your best buy in motor compressors and condensing units. Get full details today.

Bendix-Westinghouse

EVANSVILLE, INDIANA

A Division of Bendix-Westinghouse Automotive Air Brake Company, Elyria, Ohio

Export Sales: Bendix International, 205 E. 42nd St., New York 17, N. Y.; Peter A. Karl, Inc., Union Station Bldg., Utica 2, N. Y.; Sabel-Kiesmann, Inc., 15 William St., New York 5, N. Y.

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MAY 1961/THE REFRIGERATION & AIR CONDITIONING BUSINESS

circle 89 on reader service card



TRUCO® DOES IT AGAIN!

Impact cutting tried and abandoned: Truco Diamond Drills and portable equipment drill 123 holes 3"-3½" in 13" reinforced concrete in just 42½ hours.

PROJECT: Veterans' Hospital, Minneapolis, Minn. **DISTRIBUTOR:** Enghauser Co., Minneapolis, Minn. **EQUIPMENT:** Truco Model B Portable Diamond Drilling Machine with 350 rpm drill motor; Truco Model S Drill Stand with 500 rpm Hand Drill Motor; Truco Tru-Vac® Vacuum Pad; Truco Diamond Drill Bits, surface set, resettable. **JOB:** Drill holes to permit removal of a section of 13" thick, reinforced concrete wall to provide access for new, bulky equipment. Jackhammers were tried but the noise proved unbearable to patients. So, Enghauser was called in and Truco equipment did the job with practically no sound, mess or disturbance to hospital routines. Truco Drill Stand (left, above) was anchored to the wall horizontally by a Truco Tru-Vac Vacuum Pad. Truco Model B (right, above) was braced to an I beam by its telescoping center post with shaft extension. A total of 123 holes, 3" and 3½" dia. were drilled in an average of 21 min. per hole; time varied with the amount of reinforcing encountered. The slab weighed 8500 lbs. and was lifted out without difficulty. Savings are so great Truco equipment may pay for itself on a single job or in a single day. Write for new Truco catalog.

MASONRY DRILLING DIVISION WHEEL TRUEING TOOL COMPANY

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MORTITE white CAULKING CORD
Package contains three 16' rolls. 3/8" rope-like cords stay permanently pliable.

MORTITE white CAULKING GUM
Comes in pliable 1 lb. slug. Hand molds into beads, wads, gaskets, etc.



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With these sealers, you can finish any caulking job easier, faster, more economically. Get the facts. Mail this coupon today.

Mortell Company
548 Burch St., Kankakee, Ill.

O.K., send full information about all Mortell refrigeration products.

I am a jobber Dealer Serviceman

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Zone _____

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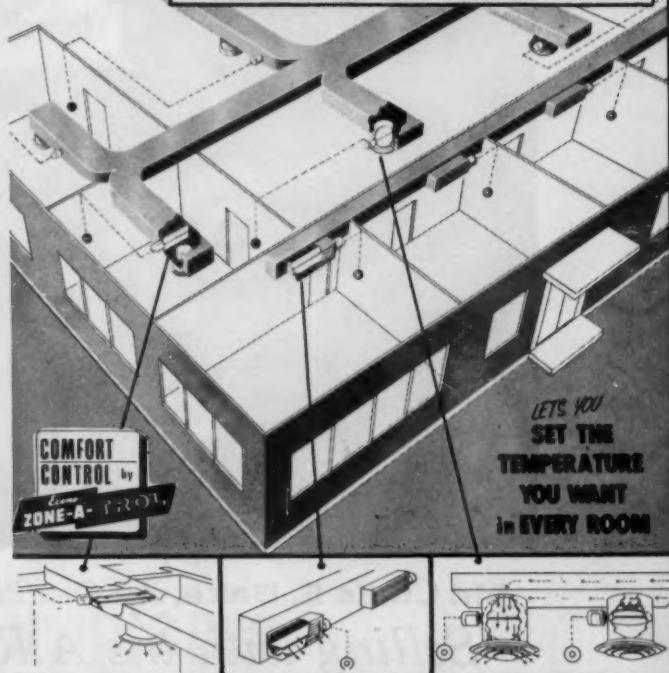
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circle 32 ▶

ZONE-A-TROL

PUTS THE

COMFORT INTO COMFORT COOLING



LETS YOU
SET THE
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YOU WANT
in EVERY ROOM

ZONE-A-TROL DAMPER ACTUATORS

Automatically Control The Flow Of Air to Each Room



Now Zone-A-Trol lets you install cooling and heating systems that . . . GUARANTEE COMPLETE COMFORT IN EVERY ROOM at EVERY HOUR of the DAY or NIGHT.

Providing the easy, inexpensive answer to installing Individual Room Temperature Control on any new or existing residential or commercial heating or cooling system; . . . Low Voltage . . . Thermostat Operated . . . Zone-A-Trol Damper Actuators . . . automatically control the flow of air to each room or zone, . . . thereby making it possible to shift the full cooling load from one room or zone to another to compensate for such factors as the afternoon sun, shifting crowds of people, etc.

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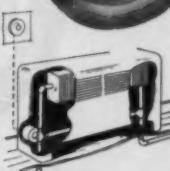
Division of Viking Instruments, Inc. East Haddam, Connecticut



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of Zone Controls



For Every Heating
and Cooling System



On Balanced Pressure Hydronic Heating - Cooling Systems Zone-A-Trol By-Pass Valves control the flow of water to each fan coil unit.





"A.R.I.
paid me
for this
testimonial—
a hundred
times"



Mr. Louis E. Bake, Air-Conditioning Dealer,* says:
**"Selling with the A.R.I. Directory is
easier, faster, more profitable."**

How profitable? Ask Louis Bake, who uses the ARI Directory regularly, finds it a big help in closing sales, and a major factor in his company's 50% sales increase in 1960.

"When I show customers that the unitary system I'm recommending is listed in the ARI Directory, and certified under the program of this national association, I add authority to my presentation.

"I point out how the equipment is carefully rated under the Certification Standards, that this rating is subject to checking at any time by the Institute through an independent testing laboratory in New York. Result: I back my sales talk with the authority of the Air-Conditioning & Refrigeration Institute, give my prospects more confidence in what I say.

"I thought selling with the ARI Directory couldn't be beat—until I saw the new ARI Consumer sales piece, 'How to Buy Central Air Conditioning.' This is a *must* for any dealer who wants to tell his prospects the *how and why* of central air conditioning. It tells the full, technical story in words John Q. Public can understand, and helps any honest dealer sell a quality system." Free copies of both the A.R.I. Directory and "How to Buy Central Air Conditioning" are available from:

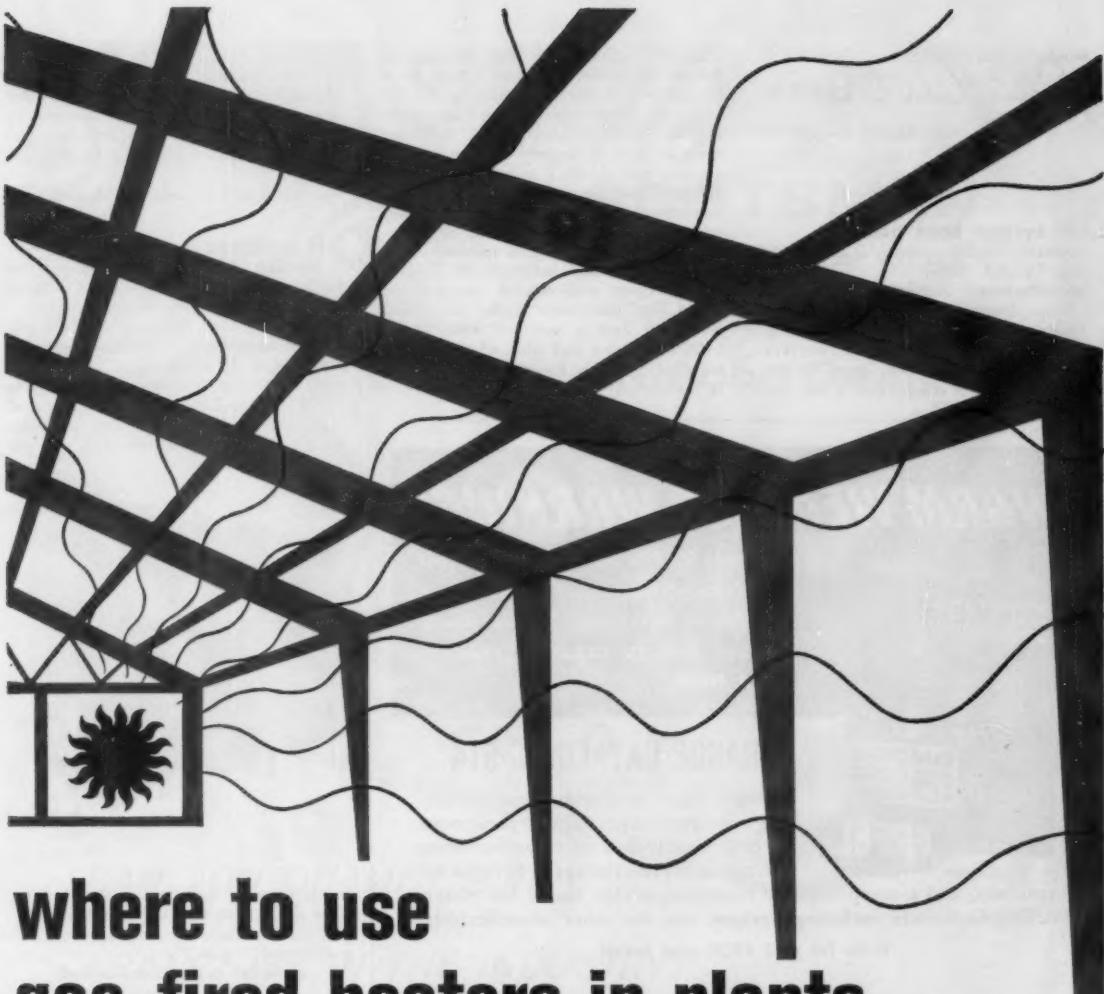
AIR-CONDITIONING & REFRIGERATION INSTITUTE
Department J-511, 1346 Connecticut Avenue, N.W., Washington 6, D.C.



*Mr. LOUIS E. BAKE is Sales Manager of Cool-Heat Sales Company, Inc. of Washington, D.C.

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MAY 1961/THE REFRIGERATION & AIRCONDITIONING BUSINESS



where to use gas-fired heaters in plants



Free from Reznor: Our just published handbook, "Industrial Applications of Direct Gas-Fired Heaters," tells all about the profitable use of Reznor heaters in manufacturing plants.

Use it to find out the many advantages—and economics, too—of using Reznor unit heaters for comfort heating of work or storage areas. For example, you can spot the heaters exactly where heat is needed, without installing long piping runs from a remote central boiler that may already be overloaded. You can use Reznor Aluminized or stainless steel duct furnaces for tempering make-up air

or heating process air. Or use them in year-round heating and cooling systems. (Reznor duct furnaces are A.G.A.-approved for downstream applications.)

Among other subjects covered: How to blanket shipping doors, how to install heaters 40 ft. high to clear crane-ways; how to use Reznor heaters for stand-by operation on liquefied petroleum gas—with city gas as standard fuel. Published by Reznor, the world's largest manufacturer of gas unit heaters, the handbook is yours free. Mail the coupon—or, call your Reznor distributor or district office, listed in the Yellow Pages under "Heaters—Unit."



REZNOR HEATERS

REZNOR MANUFACTURING COMPANY
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Send me a copy of "Industrial Applications of Direct
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company. _____
address. _____
city. _____ state. _____

K-1101

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THE REFRIGERATION & AIRCONDITIONING BUSINESS/MAY 1961

Product DATA

Continued from page 86

Split system heat pump

Product: Split system 3 hp heat pump (Model 3204).

Manufacturer: Airtemp Div., Chrysler Corp., Dayton, Ohio.

Features: Has 33,000 Btuh cooling and 32,000 Btuh heating capacities and has checklight which lights on indoor thermostat if compressor is not operating.

Supplementary heat available in 4.8 kw up to 14.4 kw and is turned on by outdoor thermostat during unit's defrost cycle to prevent cold air from blowing into airconditioned space. Will operate at 120 F outside temperature in summer and at -10 F in winter. Also has special expansion valves for both cycles, insulated refrigerant line, and subcooling pass which allows indoor unit to be installed any height above outdoor unit. Measuring device automatically begins defrost cycle and control attached to liquid line terminates cycle when coil defrosted. Unit is matched with Model 1454 evaporator coil unit which can be installed vertically for upflow application or horizontally when used with ductwork

and horizontal free air delivery. Possible to independently operate indoor blower of unit for air circulation to stop it during defrost cycle. Strip heaters automatically energized in 4.8 kw steps, assuring lowest power demand and best temperature control.

circle 145 on reader service card

Lint arrester

Product: "Lint-A-Maze" lint arrester for removing lint and fibrous material from air in high volume application.

Manufacturer: Air-Maze Div., Rockwell-Standard Corp., Cleveland, Ohio.

Features: In wide range of sizes to meet air flow requirements from 7000 to 150,000 cfm. Low pressure drop and high arresting efficiency with velocities of 250 to 1900 fpm. Powered sweeper

WARM WEATHER WARNING!

Be ready for the Summertime Boost in Air-conditioning, Refrigeration, and Motor Servicing . . . Get these 2 great aids to capacitor replacement NOW!



FREE!

Capacitors, and a comprehensive Interchangeability Guide for Motor-Starting Capacitors including Sprague and ten other manufacturers.

Write for your FREE copy today!

SPRAGUE MODEL M-2 MIKE-O-METER®

A capacitor tester designed specifically for motor service technicians. This handy little instrument weighs only 6 lbs.—it goes where you go! A twist of a dial tells you whether capacitors are good or bad, measuring capacitance and power factor by the accurate Wien Bridge method.

Built for rugged service, the components inside the sturdy steel case are especially chosen for long, dependable life. Complete with operating manual, the M-2 has a net price of only \$32.50



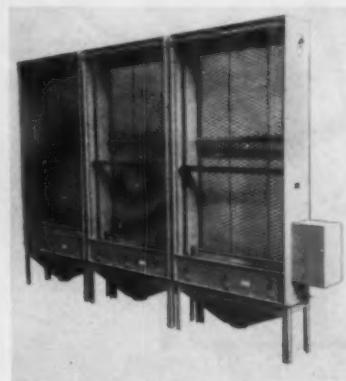
Order yours NOW for the Summer Season!

Sprague Products Company
53 Marshall Street
North Adams, Mass.

World's Largest Capacitor Manufacturer

SPRAGUE
THE MARK OF RELIABILITY

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brush removes collected material from filter media face and deposits it in hopper. Sizes of standard models from 2'10" x 4'1" to 21'1" x 10'3".

circle 146 on reader service card

Glass-door refrigerator

Product: Glass-door reach-in refrigerator in self-contained and remote models.

Manufacturer: Tyler Refrigeration Corp., Niles, Mich.

Features: Capacities of remote models are: 21.5, 43, and 67.3 cu.ft.; self-contained models are 16.75, 38.2, and 62.5 cu.ft. Interiors stainless steel, baked white enamel, or aluminum. Has four copper nickel, chrome-plated wire shelves, three per 1/2-length cavity, and chrome-plated pan slides for 18 x 26" pans.

circle 147 on reader service card

Airconditioner timer

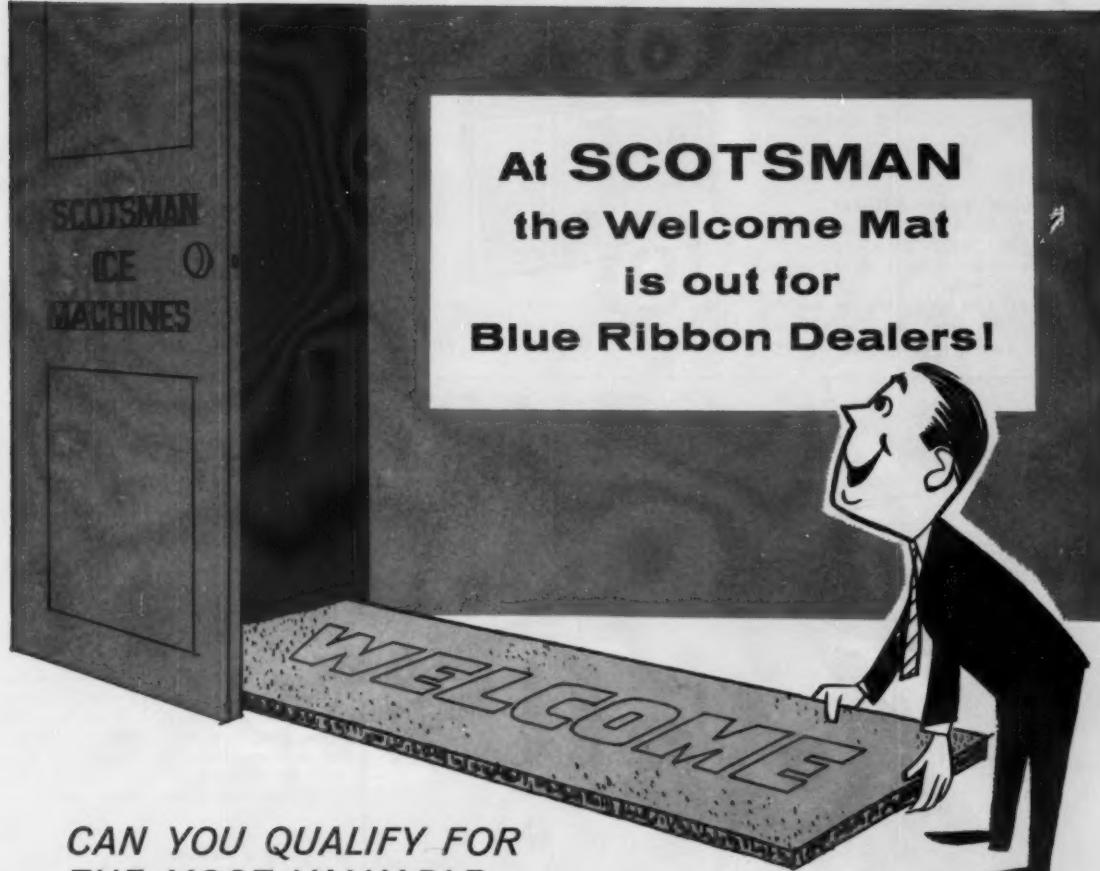
Product: Automatic timer that programs full week's operation of room airconditioners.

Manufacturer: Admiral Corp., Chicago, Ill.

Features: On and off times set on lower dial, days of operation on upper dial. For people who want to return to building that's cooled without having unit run continuously during absence. In 115 and 230 v. models.

circle 148 on reader service card

Continued on page 84



**CAN YOU QUALIFY FOR
THE MOST VALUABLE
FRANCHISE IN THE INDUSTRY?**

ATTENTION AGGRESSIVE DEALERS!

Have you checked on the profit potential of Scotsman Ice Machines?

The Scotsman franchise is a golden invitation for you to make big profits from the leading ice machine line in the field. Top dealers who handle Scotsman can expect top profits. And they get top-notch treatment from Scotsman too!

Remember this: Scotsman doesn't offer its line to every dealer up and down the street . . . Scotsman dealers are *carefully selected*. This means Scotsman dealers have ample selling 'territory' to make handsome profits. They

handle the largest line in the business that produces balanced sales of large, medium and small units. Scotsman dealers have more to sell —thus they make more money!

And don't forget: Scotsman dealers get tremendous merchandising and advertising support that is unmatched in the industry. New markets are cultivated month after month...old markets are kept sold and broadened in size. You profit day after day in your own area by this intensive advertising and promotion program.

Find out now if you qualify for the most valuable franchise in the ice machine industry. It may mean big money in your pocket!

SCOTSMAN

Modernize with Modern Ice!

ICE MACHINES



YES! Send me complete information about a franchise for Scotsman Ice Machines.

NAME _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

MAIL TO: **SCOTSMAN ICE MACHINES**
Queen Products Division, King-Seely Corporation
195 Front Street, Albert Lea, Minnesota
EXPORT OFFICE: 15 William St., New York, N.Y.

circle 73 on reader service card

Product DATA

Continued from page 82

Multi-room airconditioner

Product: Multi-room window airconditioner (250 Series "Air Command").

Manufacturer: Amana Refrigeration, Inc., Amana, Iowa.

Features: Can be installed in double-hung windows small as 28" wide and provides 23,000 Btu cooling capacity.



Has 8-position thermostat, large cooling coils, and quiet turbine. Has $\frac{1}{4}$ hp fan motor and delivers 600 cfm. Operates

in 230 v., 13.5 amps., and 2850 watts. Measures 20 x 26 $\frac{1}{2}$ x 30".

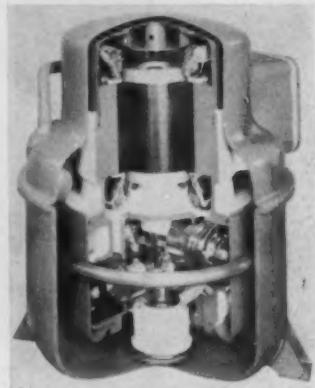
circle 149 on reader service card

Hermetic compressor

Product: Model D hermetic compressor in 5 and 7 $\frac{1}{2}$ hp.

Manufacturer: Trane Co., La Crosse, Wis.

Features: Crankshaft and rotor statically and dynamically balanced as assem-



bly, anti-slugging valve releases pressure when liquid enters cylinders, built-in suction and discharge line mufflers cut noise, and regulator maintains constant oil pressure. Connecting rods and pistons are aluminum to reduce unbalance.

circle 150 on reader service card

Ductwork notcher

Product: "Speednotch" sheet metal ductwork gangnotcher.

Manufacturer: Lockformer Co., Chicago, Ill.

Features: Capacity is 16 gage mild steel and up to five notches can be set up in pieces with 3 $\frac{1}{2}$ " to 10' stretch-



out. Has hydraulic pump, 3 hp motor, oil reservoir, solenoid main operating valve. Standard tools includes three 40-degree v-notch and two 115-degree end-notch punch-die sets.

circle 151 on reader service card

Exhaust fan curb

Product: Roof exhaust fan curb.

Manufacturer: Davidson Fan Co., Newton, Mass.

Features: Is all aluminum and "T-A" (thermal-acoustic). Special deep mounting flange allows greater flexibility for inserting curb in roof opening. Provides thermal insulation to prevent building rusting and rotting damage. Spun glass

Continued on page 86

Here's
the one with
ALL the
most wanted
features . . .

**THE LIQUID EYE®
POSITIVE SEALING INDICATOR**

- Pyrex glass, double pressure sealed at sides and ends
- Positive check of refrigerant condition
- Unrestricted full line flow
- Spring-loaded gaskets insure positive seal against leakage
- Guaranteed to 500 PSI
- Precision made

ECONOMICAL—DEPENDABLE—USE WITH CONFIDENCE

Used by leading manufacturers on original equipment

Sold by leading wholesalers everywhere

Write today for new Catalog covering the complete Allin Line



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Over 1,000,000 Liquid Eyes in use today!

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PENN WATER VALVE OUTSELLS ALL OTHERS



ONE BIG REASON is that the Penn "246" stays on the job longer than ordinary valves. In the Penn water valve, two diaphragms keep water away from the bellows, range spring and sliding parts. Thus, water with its rust, corrosion and sedimentation never has a chance to attack these "working parts" and cause destruction. Ask your wholesaler... he'll tell you the Series 246 is the best.

PENN CONTROLS, INC. Goshen, Indiana

EXPORT DIVISION: 27 E. 38th ST., NEW YORK, N.Y.

AUTOMATIC CONTROLS FOR HEATING, REFRIGERATION, AIR CONDITIONING, APPLIANCES, PUMPS, AIR COMPRESSORS, ENGINES

circle 62 on reader service card

Product DATA

Continued from page 84

fiber absorbs noise and reduces reverberation. Welded all aluminum construction eliminates joints that could loosen and strong fastening flange provided for duct connection. Also comes with mounting shelf for self-acting louver, neoprene coated insulation and cushion for fan mounting.

circle 152 on reader service card

Acetylene torch

Product: "Prest-O-Matic" air acetylene torch.

Manufacturer: Navan Products, Inc., El Segundo, Calif.

Features: Flame triggers on or off without external lighting. When trigger pressed, battery-operated electronic device lights torch instantly. Releasing trigger shuts off gas and flame goes out. Produces more heat than air-gas torches and ideal for silver brazing, soldering, and tempering of light gage metals. Comes with fine, medium, or large tips. Gas consumption reduced up to 80% on stop-go jobs.

circle 153 on reader service card

Solenoid valve

Product: Compact, high pressure solenoid valve for fluid (liquid and gas) control.

Manufacturer: General Magnetics, Inc., Minneapolis, Minn.

Features: In six to 64 v. dc; six, 12, 24 and 110-220 v., 60 cycle ac; and 110 v., 400 cycle ac models. Operates in any position with maximum rate of 1000 cycles per minute at 100 psi. Is also available in water- and fungus-proof



models. Using from one to three watts of power, will serve under pressures up to 200 psi in temperatures ranging from -65 to 350 F. Weighs only 5 oz. and has inlet connection of $\frac{1}{4}$ " npt with outlet connection of $\frac{1}{4}$ " npt. Overall length is $2\frac{1}{2}$ " with $1\frac{1}{2}$ " dia. Also has self-supporting, in-line mounting and synthetic rubber needle valve that is self-aligning and provides positive closeoff at any pressure. No gaskets used and all parts stainless steel and silver-brazed. Standard lead lengths up to 24" available.

circle 154 on reader service card

NEW ADJUSTABLE LINE TAP VALVES



PART NO. AP-1

For $3/16$ ", $1/4$ ", $5/16$ ", $3/8$ " O.D. tube. The AP-1 adjusts to fit any of the above size tubes.



PART NO. AP-2

For $1/2$ " and $5/8$ " O.D. tube. The AP-2 conforms to the tube. An insert which, when used, adapts the valve to $1/2$ " O.D. tube. The insert is removed when used on $5/8$ " O.D. tube.

For charging, discharging, purging and testing refrigeration and air conditioning systems. Just 2 valves cover 6 sizes of tubes ranging from $3/16$ " O.D. to $5/8$ " O.D.

THE ADJUSTABLE LINE TAP VALVES may be installed under pressure and in any position, and incorporates the following features:

- QUICKLY INSTALLED FROM THE TOP WITH THREE PHILLIPS HEAD SCREWS
- ONE PIECE NEEDLE AND SHAFT MAKES IT IMPOSSIBLE FOR NEEDLE TO LOOSEN AND FALL OUT
- EASY-TO-GRIP "DELRIN" "T" HANDLE CANNOT BREAK OR LOOSEN
- ADDITIONAL SEALING CAP FOR MAXIMUM PROTECTION
- STREAMLINE FINISH—NO ROUGH EDGES ON WHICH TO SCRABE YOUR HANDS
- CONTOUR MILLED
- PACKAGED IN RE-USABLE, HINGED PLASTIC BOX

*New DuPont wonder plastic

For additional information, see your wholesaler or write to Dept. B-5



circle 88 on reader service card

Marine refrigerator

Product: Self-contained marine refrigerator (Models "Helmsman", "Mariner") for boats to 35'.

Manufacturer: Lec Refrigeration, Inc., Fort Lauderdale, Fla.

Features: Operate from boat's batteries or from ac outlets at dockside. Built of single, wrap-around sheets of zinc-coated metal with inside shelves and



trays of plastic over metal. Designed specially for boats in 18 to 35' class. "Mariner" has capacity of 2.2 cu.ft., "Helmsman", 4.2 cu.ft.

circle 155 on reader service card

Air regulating damper

Product: "Controllaire" air volume regulating damper for adjusting combination heating and cooling systems.

Manufacturer: Lau Blower Co., Dayton, Ohio.

Features: Opens or closes to adjust air volume but also permits air redirected by damper to flow out of blower housing through rectangular openings and

Continued on page 89

"ROCKET" YOUR CENTRAL AIR CONDITIONING SALES WITH THIS TERRIFIC NEW G-E PROMOTION FOR '61!

5 Complete New Advertising/Promotion Program. Gives you everything you need to make '61 your biggest year ever! Here are just a few of the program's highlights.



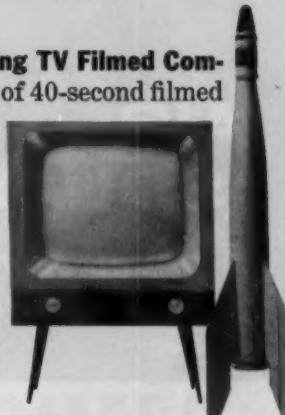
3 Valuable Consumer Incentives ... will again be offered to help stimulate both consumer and builder markets.



1 Identification Program & Finance Plans. To "spotlight" you as an alert, aggressive G-E dealer, an Identification Program has been developed that includes illuminated signs, letterheads, uniforms, etc. And nobody beats G.E. when it comes to financing! This is your bang-up G-E promotional package for 1961—everything designed to make your selling job easier, to make your profits rocket!



4 Attention-Getting TV Filmed Commercials. A series of 40-second filmed commercials have been prepared to tie directly with your newspaper advertising. They will be aired in markets across the nation with 20-second local dealer "tags."



2 Dealer Trip Incentive. Again, in '61, there will be another fun-filled, all-expense trip for eligible dealers and their wives. Last year, 600 G-E dealers visited Bermuda. This year, the destination is... SPAIN!



FIRE... off this coupon today and get ready for the greatest season yet! (Or contact your nearest General Electric heating and air conditioning distributor for full details.)

RB-5

General Electric Company
Air Conditioning Dept.
P. O. Box 3236, Station A
Tyler, Texas

Name _____

Firm _____

Address _____

City _____

County _____ State _____

GENERAL ELECTRIC

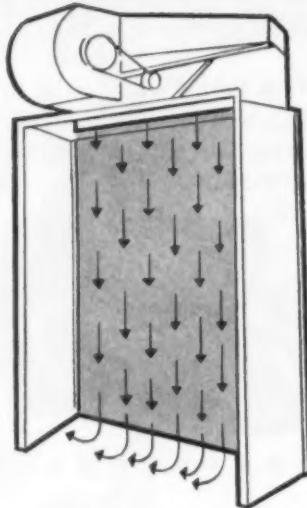
Air Conditioning Department, Tyler, Texas

circle 35 on reader service card

THE REFRIGERATION & AIRCONDITIONING BUSINESS/MAY 1961

AIR ISOLATOR*

**opens doorways to
unlimited traffic**

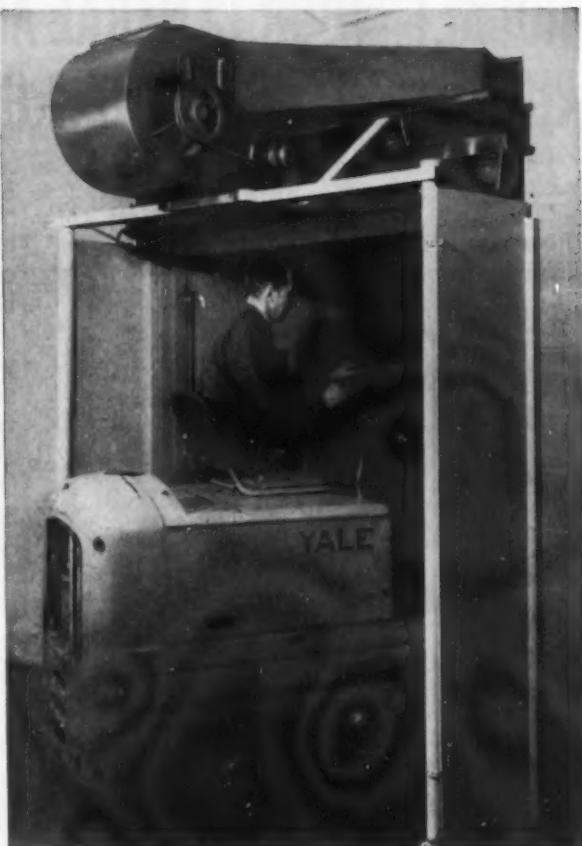


Air Isolator is available
for openings up to 8' wide, 10' high.

* registered trademark and product of Lehigh, Inc.

WRITE FOR INFORMATION

Complete data on the economical Air Isolator is yours for the asking. Write today to Jamison Cold Storage Door Co., Hagerstown, Md.



Traffic speeds through "open" door as Air Isolator immobilizes movement of air between the two areas.

**screens out heat, cold,
humidity, dust, odors, insects**

- AIR ISOLATOR is the proven and practical answer to high volume traffic problems in busy Food Processing Plants everywhere.

AIR ISOLATOR provides a high velocity curtain of vertical air across open doorways to form a shield between outside and inside air. During periods of heavy traffic, doors can be opened and left open. Traffic moves faster; dust, cold, heat, odors or insects are repelled; worker comfort is assured.

JAMISON
COLD STORAGE DOORS

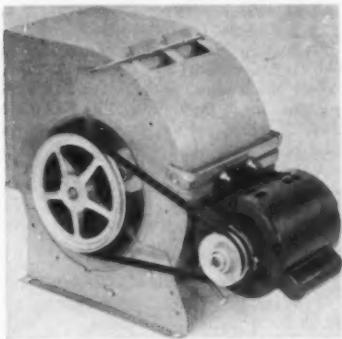
circle 40 on reader service card

MAY 1961/THE REFRIGERATION & AIR CONDITIONING BUSINESS

Product DATA

Continued from page 86

recirculated within blower compartment, no blower motor at constant speed, no matter what damper setting. Also for belt-drive blowers. Is being incorporated



into 9 and 10" dia. direct-drive blower assemblies and 9, 10, and 12" dia. belt-drive blowers.

circle 156 on reader service card

Roof ventilator

Product: Direct-drive centrifugal roof ventilator (Model CRD).

Manufacturer: Industrial Div., American Standard, Detroit, Mich.

Features: In eight wheel sizes with capacities from 194 to 2788 cfm. Offers fabricated aluminum fan wheel, die-



formed rim and blades, deep-spun streamlined inlet. Housing in three sizes. Equipped with open motors with rubber-mounted ball bearings. Blades mounted between heavy-duty backplate and rim.

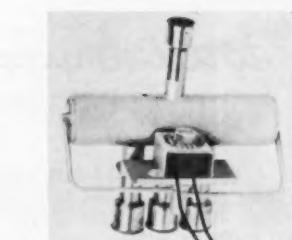
circle 157 on reader service card

Reversing valve

Product: Model KV44 4-way reversing valve.

Manufacturer: General Controls Co., Glendale, Calif.

Features: For control of refrigerants in reverse cycle airconditioning systems, heat pumps, and hot gas defrost applications. Features true hermetic valves with full ported poppet type pilot valve and plastic encapsulated coils. Pilot valve



rigidly mounted to main valve, permitting shift of main slide valve with both low and high system pressures. Precision ground pistons and honed bore on main valve permit use of brazing tem-

peratures. Coil voltage all commercial ac voltages, continuous coil power requirement is 18 VA ac, maximum operating differential and safe working pressure of 500 psi, and minimum changeover pressure differential of 40 psi are other features of valve.

circle 158 on reader service card

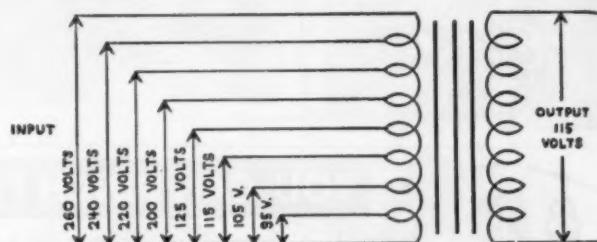
Ice merchandiser

Product: "Brownie" ice merchandiser.
Manufacturer: K. G. Brown Mfg. Co., Mattituck, N.Y.

Features: In two sizes, 38 and 54 cu.ft. Offers wrap-around aluminum interior and exterior, bonded polystyrene

Continued on page 90

TAPPED WINDING TRANSFORMERS

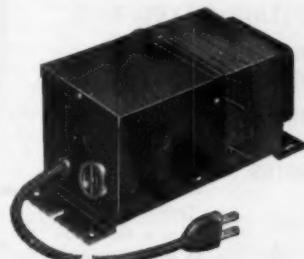


• Tapped winding transformers, solve both sales and installation problems, inexpensively. For example; where an air conditioner, refrigerator, or other appliance, powered by a 115 volt motor is to be installed in a location where only 230 volt power circuit is available, a tapped winding transformer plugs into the power circuit and supplies 115 volt service to the appliance.

for 260/240/220/200/125/115/105/95

volt primary connection and when connected to the proper primary taps will provide a 115 volt source of supply.

Available in ratings of 350, 550 and 750 VA. Other models provide 230 volt output from 208 volt available circuits. Write for Bulletin TW-320.



Or, as another example; where the appliance installation is made in a location where supply voltage is below the normal required for good motor performance (105 volts or lower) then the input line connected to the proper taps can improve the low voltage condition and provide 115 volt service.

As shown in the diagram this transformer is designed with taps

ACME ELECTRIC CORPORATION
825 WATER STREET
CUBA, NEW YORK



circle 2 on reader service card

circle 24 on reader service card

CABINET CO., Inc.
1401 Locust Street, Philadelphia 3, Pa.

COLDIN

Mr. Dealer!
If You Service
FOOD RETAILERS
HOTELS
RESTAURANTS
INSTITUTIONS
CLUBS
with
COMMERCIAL
REFRIGERATORS

Let Coldin show you the way to greater prestige and profits. The Coldin line is largest and most diversified on the market . . . quality cases engineered to highest specifications. Franchises are available. Send for facts and catalog.



Your Key To
Better Refrigeration



When you specify AIRSERCO PRODUCTS you are buying "THE STANDARD OF THE INDUSTRY" in ...

- TESTING INSTRUMENTS
- PRECISION VISUAL MEASURING EQUIPMENT
- HIGH VACUUM PUMPS, GAUGES, AND ACCESSORIES

Airserco is the "complete line" from a test cord to a full production line facility.

"AIRSERCO . . . creative leader in the industry since 1933."



AIRSERCO MANUFACTURING CO. PITTSBURGH 13, PENNSYLVANIA, U.S.A.

See your wholesaler or write us for complete catalog.

90

circle 5 on reader service card

MAY 1961/THE REFRIGERATION & AIRCONDITIONING BUSINESS

Product DATA

Continued from page 89

insulation, $\frac{1}{2}$ hp compressor, and electric defrost blower system. Shipping weights of 38 and 54' units are 285 and 350 lb., respectively.

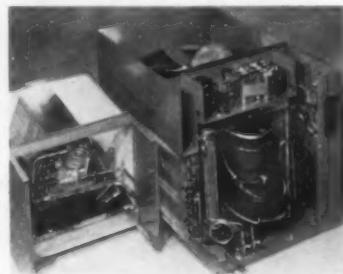
circle 159 on reader service card

Remote airconditioner

Product: Remote residential airconditioner ("Champion").

Manufacturer: York Div., Borg-Warner Corp., York, Pa.

Features: In 2- and 3-ton sizes. Has compressors with external spring mounts and crankcase heaters, high and low



YOU CAN PINCH PENNIES ...

but the man who needs servicing and testing equipment is already paying for it!



Prof. Know How's CORNER

AIRSERCO PRODUCT OF THE MONTH



Portable Recording Voltmeter

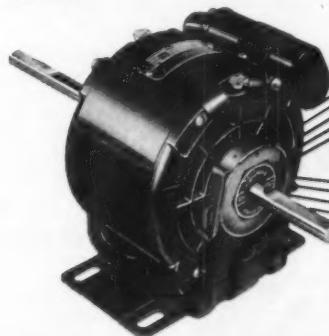
HIKE YOUR PROFIT LINE—

WITH *Redmond's*

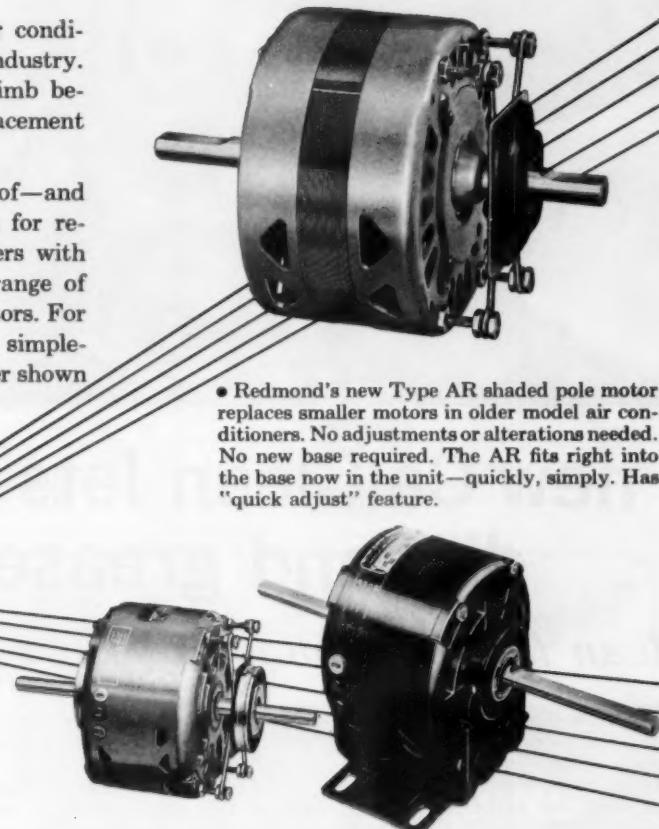
COMPLETE LINE OF AIR CONDITIONING REPLACEMENT MOTORS

Here's the most complete line of air conditioning replacement motors in the industry. Sales and service profits will really climb because these motors increase your replacement market.

They're dependable, quiet, fool-proof—and they'll meet all of your requirements for replacing motors in room air conditioners with from 1/3 to 3-ton capacities. A full range of bases is available for base-mounted motors. For complete details on these easy-to-sell, simple-to-install motors, send for the free folder shown below.



• The Redmond Type CY is a permanent split capacitor motor combining higher starting torque with increased efficiency. Operates on very low current, hence is cooler-running, more economical. Is totally enclosed for protection against high humidity.



• Redmond's new Type AR shaded pole motor replaces smaller motors in older model air conditioners. No adjustments or alterations needed. No new base required. The AR fits right into the base now in the unit—quickly, simply. Has "quick adjust" feature.

• The AY by Redmond is available both as a base-mounted motor and with a "quick adjust" feature. Each type has drip-proof stator, with top half of motor enclosed, to guard against moisture. Easy to install because you just mount it in and plug in the leads. No wires to get in your way. Adjustable end mounted motors require only two simple adjustments to fit into most bases.

DISTRIBUTORS DIVISION



Send For FREE FOLDER containing complete information on Redmond's money-making line-up of replacement motors for room air conditioners. Ask for "PROFITS FROM REDMOND."

Redmond

COOKSVILLE, ONTARIO • Subsidiary of

CONTROLS COMPANY

The Standard of Dependability

Company, Inc.

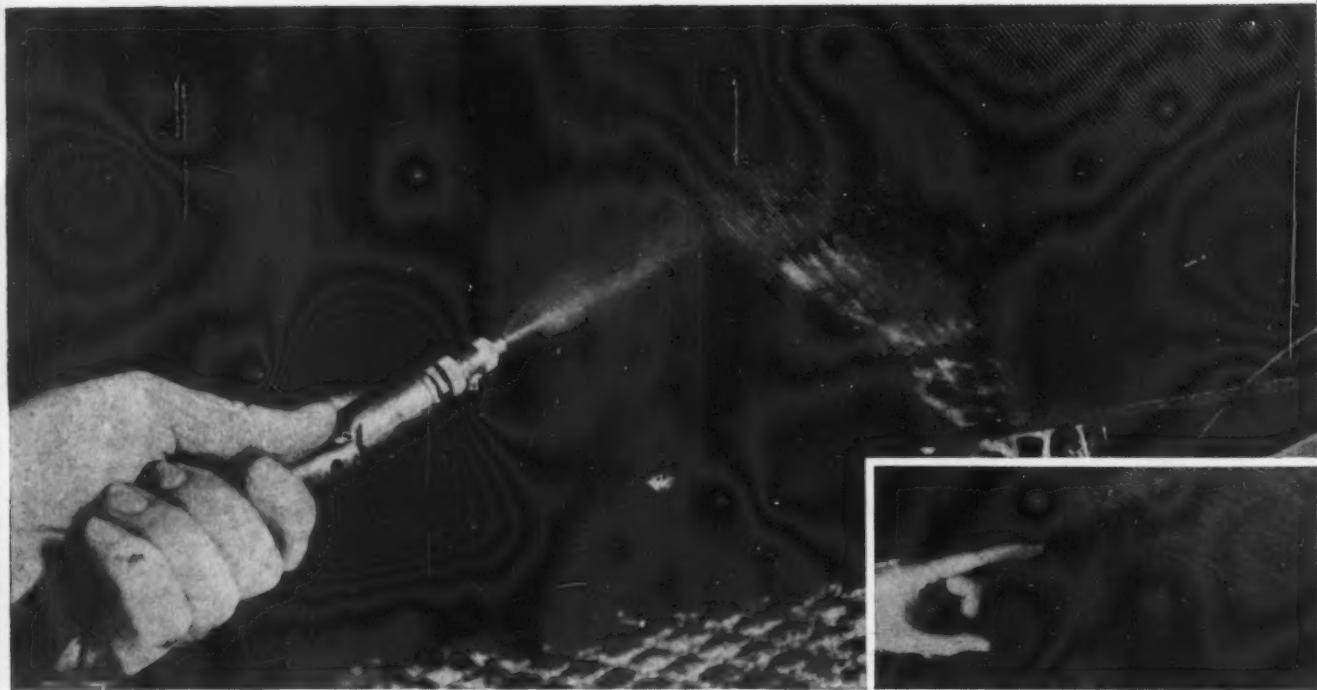
OWOSO, MICHIGAN



OF AMERICA • ZUG, SWITZERLAND

circle 69 on reader service card

THE REFRIGERATION & AIRCONDITIONING BUSINESS/MAY 1961



Upper right area—clean with CalClean

new CalClean lets you spray dirt and grease away!

clean finned cooling coils the EASY Calgon way

Finned coils that are coated with grease and oil-bound dirt cannot function at top efficiency. Airflow is impeded and heat transfer is lowered. Now, CalClean makes the job of cleaning such equipment simple and easy. CalClean is a heavy-duty liquid detergent that is high-powered, yet so safe you can use it to wash your hands. It destroys grease and tar residues by chemical action—not by just flushing it away. Here is how easy it is to use CalClean:

1. Spray solution on surfaces to be cleaned—let stand for five minutes.
2. Flush with clear water.

That's all there is to it. The heaviest grease and grime can be removed with a solution made up with five parts water and one part CalClean. CalClean is not only the most effec-

tive cleaner for finned coils—it is the most economical because you dilute it with FIVE parts water.

CalClean can be used on finned coils of all kinds—evaporator coils, window units (cover fan motor with plastic to keep windings dry), air cooled condenser coils, heating coils, permanent air filters, or on any other greasy equipment that is not affected by plain water. It is fine for cleaning equipment in food plants and stores.

CalClean is one of the quality Calgon products—which include Calgon® Scale Remover, Micromet® Plates and the most complete line of other water treatment products. Ask your refrigeration wholesaler about CalClean or any of the Calgon line.

CALGON COMPANY
HAGAN CENTER, PITTSBURGH 30, PA.



The No. 300 CalClean Sprayer is a low cost sprayer designed specifically for use with CalClean. Large air pump in 3½-gallon tank saves time. It's easy to reach hard to get at places with the 20-inch extension tube and 10 feet of hose.



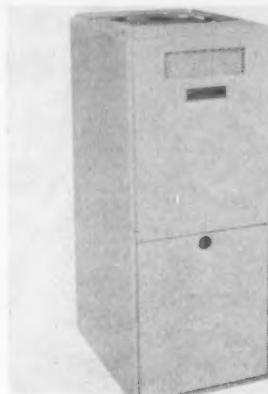
DIVISION OF HAGAN CHEMICALS & CONTROLS, INC.
circle 20 on reader service card

MAY 1961/THE REFRIGERATION & AIR CONDITIONING BUSINESS

Product DATA

Continued from page 90

thermostat. Successive stages activated in 2-minute cycles as more heat required to maintain even temperature. Excessive bonnet heat or power failure stops all stages. Cabinets of reinforced steel and have glass fiber insulation with aluminum foil facing. Other features:



removable front panels, knockouts for ducts, adjustable pulleys, fused circuit, large capacity replaceable glass fiber filters, and electronic air cleaner. Up to four nominal tons cooling can be handled with standard blower.

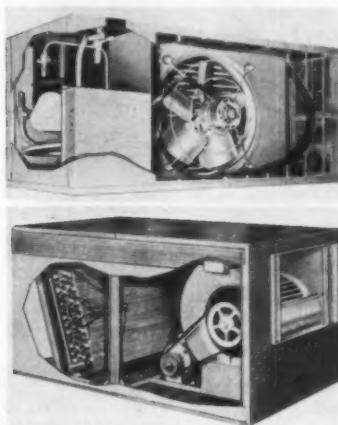
circle 162 on reader service card

Remote condensing unit package

Product: Remote condensing unit (Type 926) with air handling coil (Type 939).

Manufacturer: Mueller Climatrol Div., Worthington Corp., Milwaukee, Wis.

Features: Condensing unit in 3, 4, and 5 ton nominal capacities with propeller fan motor mounting that uses neoprene vibration eliminators. Uses 850 rpm motors for quieter operation. Air



handling coil for use with a remote cooling system and in 2, 3, 4, and 5 ton nominal sizes. Can be used as an upflow, counterflow, or horizontal (shown). Great number of air flow patterns obtainable within these applications.

circle 163 on reader service card

Line of refrigerators

Product: "V-Line" of refrigerators (Model VS-48-S) with half or full length doors.

Manufacturer: Victory Metal Mfg. Corp., Plymouth Meeting, Pa.

Features: Has interchangeable interiors, pull-out or stationary shelves, adjustable pan slides, pull-out or stationary mean rails, pull-out or fractional pan supports, ball bearing drawers. Available with half or full length doors in one, two, three, and four sections in normal temperature refrigerators, warming cabinets or freezers in self-contained, remote, and pass-thru models.

circle 164 on reader service card

Merchandising cabinet

Product: Island merchandising cabinet (Models IR-3696, IR-36126).

Manufacturer: Savage Ice Cream Cabinet Div., C. V. Hill & Co., Inc., Trenton, N.J.

Features: In two lengths, 7'6" and 10', which have respective capacities of 288 and 408 half gallons of ice cream. Is

Continued on page 94

circle 49 on reader service card

MORE SERVICEMEN PREFER MADDEN



BEST BUY
FOR THE
MONEY

1 VALVE
PIERCES
4 TUBE
SIZES!

3/16" | 1/4" | 5/16" | 3/8"

DUO-TEST QUICK COUPLER
CHARGING LINES

36" flexible line. Quick
Coupler elbow on one
end. Color coded in
sets.



Stocked by leading wholesalers everywhere



MADDEN BRASS PRODUCTS COMPANY
AURORA 2, ILLINOIS, U.S.A.

EXPORT: AD AURIEMA, INC.
85 BROAD ST., New York, N.Y.

Had Enough?

Switch to a

READING

Job-Planned
UTILITY BODY

Don't pile it... file it!

If you're spending as much time looking for tools and equipment as you spend on the job, it's time to make the smart switch to READING! "Magic Stowaway" compartments keep everything neatly filed, at your fingertips when and where you need it. You save time and money on every

call! READING Bodies are built by master mechanics for master mechanics . . . mass-produced to cost you less. ★Get the Proof! See your truck dealer today for a free demonstration and all the facts. Or write direct for catalog and name of local distributor.

READING BODY WORKS, INC., Dept. R561, 420 Gregg Avenue, READING, PA.

circle 67 on reader service card

Product DATA

Continued from page 93

fully protected with split-coil refrigeration system which provides 6 to 10 F lower temperatures without increased



horsepower. Endless construction permits continuous lineup installation and unit both visible and accessible from all four sides.

circle 165 on reader service card

Makeup air unit

Product: "Sun-Flo" vertical makeup air unit (Model VR-2).

Manufacturer: Metals Engineering & Mfg. Co., Inc., Detroit, Mich.

Features: For roof-mounting, is direct gas-fired. Capacities from 20,000 to 60,000 cfm, and Btu from 1,875,000 to



6,000,000. Air intake through louvers on top of unit. Controls mounted inboard with access through walk-in door. Remote control station available with buttons and summer-winter selector switch. Filter banks optional.

circle 166 on reader service card

Rail door

Product: Single sliding meat rail door that eliminates notch or cut-out in overhead track.

Manufacturer: Clark Door Co., Inc., Newark, N.J.

Features: Uses bare wall space and permits increased accessibility of floor and track areas. Products suspended from rails don't need to be stopped or

moved back to avoid interference with arc of door swing. Made for either manual or automatic operation. If door now manually-operated, automatic or electric power operator can be added. Door comes in packaged assembly, can replace hinged doors, and applied inside freezer if desired. Also available in light cooler where temperature ranges are moderate. Cuts heat loss into refrigeration compartments because open-door time reduced.

circle 167 on reader service card

Testing kit

Product: "Ampprobe Junior Testmaster" testing kit.

Manufacturer: Ampprobe Div., Pyramid Instrument Corp., Lynbrook, N.Y.

Features: Includes new snap around instrument that measures voltage without interrupting service as jaws snap around the conductor, tests voltage on calibrated scale, and measures resistance. Completely insulated kit pocket-sized for hand operation and consists of instrument itself, an ohmmeter battery attachment, two safety-type leads, the "Ampprobe Energizer" that splits double-conductor cords for readings at outlet or boosts sensitivity of instrument 10 times for testing fractional hp motors, and carrying case. Six models available—from 25 to 100 amps, either 125-250 or 150-600 v. ac, and ohmmeter scale with mid-range readings of 25 ohms.

circle 168 on reader service card

Colored cold storage door

Product: Colored plastic cold storage door.

Manufacturer: Jamison Cold Storage Door Co., Hagerstown, Md.

Features: For feeding, food handling, and laboratory installations. Provided in white, ivory, salmon, blue, and blue-green with pigments permanently incorporated in the door surface. Specially suitable for doors that are seen by public. Weight of doors only 4 1/2 lb. per sq.ft. and they have 4 and 6" foamed plastic insulation with a K factor of 0.15 at 75 F. Rigid outer shell of glass fiber reinforced polyester plastic is permanently bonded into a monolithic unit by foamed-in-place polyurethane plastic inside the door. Exterior surfaces are hard, smooth, and chemically inert for easy cleaning.

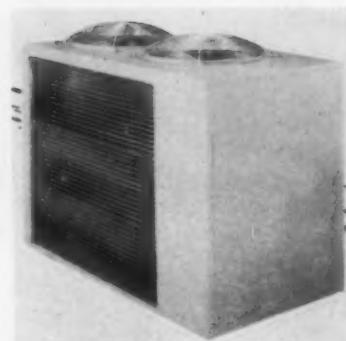
circle 169 on reader service card

2-model condensing unit

Product: High capacity air cooled condensing unit for split systems (10 hp Model 1212, 15 hp Model 1216).

Manufacturer: Airtemp Div., Chrysler Corp., Dayton, Ohio.

Features: Model 1212 has 114,000 Btu capacity when used with Model 1412 cooling coil, which delivers 4000 cfm or can be matched with two Model 1408-03 coils. Model 1216 can be matched with Model 1416 cooling coil which delivers 154,000 Btu and 8000 cfm, respectively. Paired with two Model 1489 coils, it delivers 186,000 Btu. Both units use a 5-cyl. compressor, oper-



ated at 120 F outside temperature, and will run when voltage reduced up to 10%. Model 1212 uses pair of 20" prop fans which operate at 1150 rpm while Model 1216 has two 24" fans which run at 825 rpm. Standard on both units are a separate receiver and strainer-drier and a hot gas bypass.

circle 170 on reader service card

Extension cord set

Product: Airconditioner extension cord set.

Manufacturer: Carol Cable Div., Crescent Co., Inc., Pawtucket, R.I.

Features: Is manufactured in attractive gray parallel vinyl plastic and available in lengths of 3, 6, 9, 12, and 15' in both 110 and 220 v. applications. Transparent vinyl plastic bag and header design provide quick identification, easy handling, and simplified inventory control.

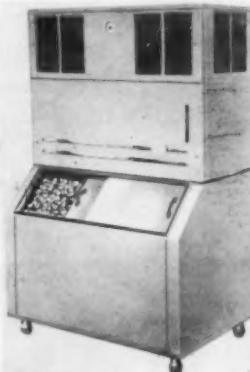
circle 171 on reader service card

Ice machines

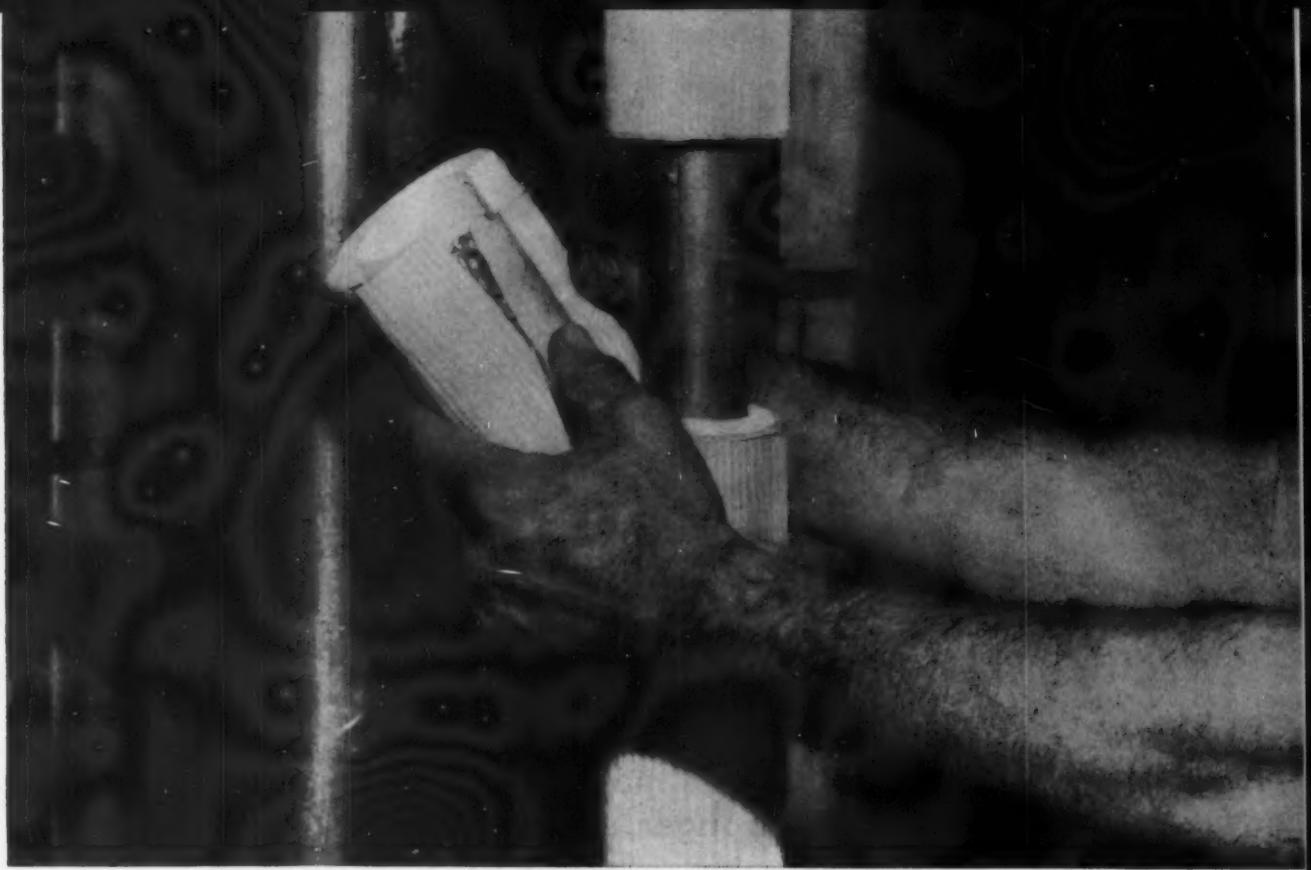
Product: New ice equipment including two cubers, flaker, two bins, two merchandisers.

Manufacturer: Scotsman, Queen Products Div., King-Seeley Thermos Co., Albert Lea, Minn.

Features: Cubers are Models SC-300



air-cooled (shown) and SC-300W water-cooled, both having daily capacity up to 300 lb. Available in grey hammerhead. Continued on page 97



PPG Fiber Glass Pipe Insulation is quickly installed, provides top thermal insulation at Fontainbleau Towers addition in Miami Beach. 100,000 ft of this insulation was used, as well as PPG Duct Liner and Duct Insulation.

"We chose PPG Fiber Glass Insulation Materials because they are easier to handle than any other insulation products"

... says Mr. Joseph Crabtree, President, Crabtree Insulation Company, Miami, Florida

Crabtree Insulation Company had the contract to install all pipe and ductwork insulation in the new 405-room addition to Fontainbleau Towers, Miami Beach. Choice of materials was given to the company.

Mr. Crabtree asked his superintendent what materials he felt should be used, and was advised that the men preferred PPG Fiber Glass Insulation Products because they were easier to handle.

As a result, Crabtree Insulation Company used 100,000 ft of PPG Pipe Insulation, 25,000 ft of PPG Neoprene-coated Duct Liner, and 25,000 ft of PPG Duct Insulation in the new Fontainbleau Towers addition.

Mr. Crabtree reports the insulation job went faster and with fewer problems than if other materials had

been used. On the basis of this job and other jobs where he had used PPG materials, he would recommend PPG with no hesitation to other contractors.

WANT TOP RESULTS? TRY PPG!

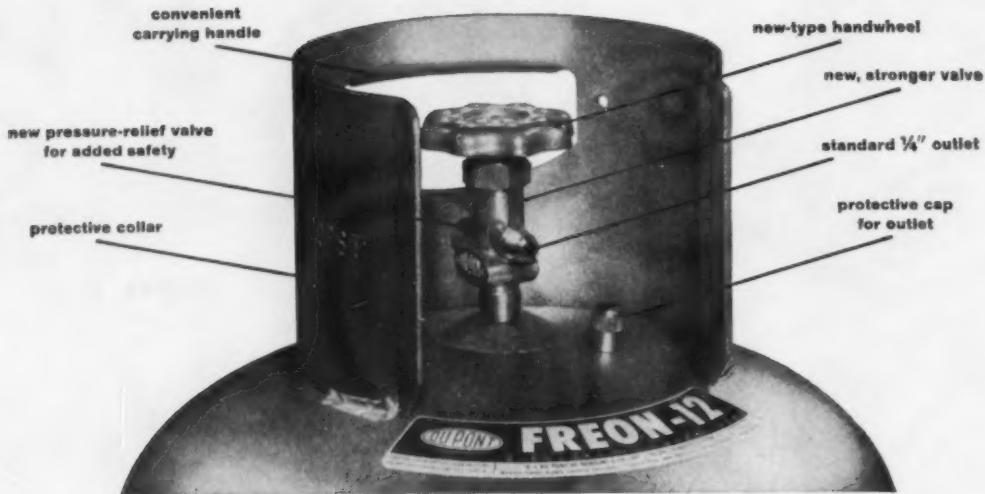
PPG has a wide range of fiber glass thermal and acoustical insulation products that speed installation, provide excellent insulating properties, give long service life with little or no maintenance. If you haven't tried them, get full information by contacting your nearest PPG Fiber Glass Sales Office, or by writing *Pittsburgh Plate Glass Company, Fiber Glass Division, One Gateway Center, Pittsburgh 22, Pennsylvania*.



PITTSBURGH PLATE GLASS COMPANY

Sales Offices: Atlanta, Boston, Buffalo, Charlotte, Chicago, Cincinnati, Cleveland, Dallas, Denver, Detroit, Houston, Kansas City, Louisville, Los Angeles, Miami, Milwaukee, Minneapolis, New Orleans, New York, Philadelphia, Pittsburgh, San Francisco, St. Louis and Seattle.

circle 64 on reader service card



See your wholesaler now for a new "Zephyr"

Redesigned valve makes "Zephyr" cylinders for FREON® stronger, easier than ever to use

While service engineers praised the light weight and convenient shape of the first "Zephyr" cylinders, they suggested several additional improvements. We've made them—to make your job of handling Freon* premium quality refrigerants even easier. And your refrigeration and air conditioning wholesaler now has these newest "Zephyr" cylinders for you—with a free bonus to boot!

COMPLETELY NEW VALVE. "Zephyr" cylinder valves have been redesigned to provide new convenience, strength and safety. Wrenches or adapters are no longer needed. You can now operate the valve with a strong but easy-to-turn handwheel—and attach charging hoses directly to its standard $\frac{1}{4}$ -inch outlet. The entire valve assembly is stronger and contains a built-in pressure-relief device which, with the fuse plug in the cylinder, makes the "Zephyr" the safest service container you can buy.

Add these new features to all the other conveniences of "Zephyr" containers for "Freon-12" and "Freon-22", and you can see why it will pay you to get your new, factory-filled "Zephyr" cylinders now.

Carry them. "Zephyr" cylinders are lightweight, with a built-in carrying handle that also protects the valve . . . now make a 50-lb. size practical.

Stack them. "Zephyr" cylinders are wider, shorter . . . can be stacked for space-saving storage, stand up on trucks.

Invert them. "Zephyr" carrying handle also acts as a stand, needs no blocks, permits easy liquid charging.



FREE BONUS OFFER! Look for the bonus envelope attached to your new "Zephyr" cylinder. It entitles you to a free can of new Du Pont aerosol "Slipspray"—a dry, all-purpose lubricant with hundreds of uses at home or work. "Slipspray" leaves no oily film . . . stops sticking, binding, squeaking on all surfaces. Offer expires June 30, 1961.

FREON® premium quality
REFRIGERANTS

Better Things for Better Living...through Chemistry

*"Freon" and combinations of F- with numbers are Du Pont's registered trademarks for its fluorocarbon refrigerants.

circle 30 on reader service card



MAY 1961/THE REFRIGERATION & AIR CONDITIONING BUSINESS

Product DATA

Continued from page 94

or stainless steel finish. Flaker, Model SF-5F, produces up to 2000 lb. crushed ice daily, with either water- or air-cooled compressor. Model SB-1000 bin for use with new flaker and Model BH-650 bin is 650-lb. capacity horizontal bin for use with either new cuber. Model IM-6 is 6-cu.ft. merchandiser chest-type freezer that holds fifteen 8-lb. bags of ice for self-service dispensing. Model IM-33 is 33-cu.ft. upright merchandiser with capacity of eighty-five 8-lb. bags of ice.

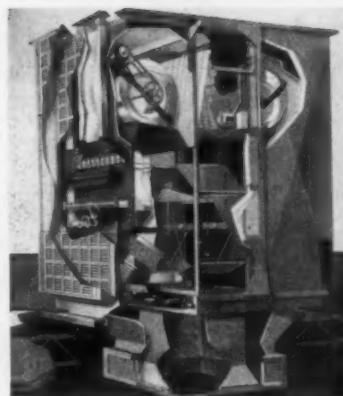
circle 172 on reader service card

Rooftop airconditioner

Product: Rooftop airconditioning, ventilating, and heating unit.

Manufacturer: Lennox Industries, Inc., Marshalltown, Iowa.

Features: Delivers either 7½ or 10 tons of cooling combined with heating capacity from 204,000 to 340,000 Btu/h in increments of 34,000 Btu/h. Conditioned air can be ducted or distributed through special diffusing head which projects below ceiling surface. Air can also be directed by separately adjustable combination horizontal-vertical louver blades. Other features are rain filter, 13.7-sq.ft.



replaceable air filter, 2"-insulated weatherproof cabinet, remote compressor-condenser unit, and linkage that has limit switch which closes outside air dampers to predetermined vent position.

circle 173 on reader service card

Door louver

Product: "C/S" extruded aluminum door louver.

Manufacturer: Construction Specialties, Inc., Cranford, N.J.

Features: In 16 gage aluminum, provides high free area in open position, and designed with all blades center

Continued on page 98

BUILD YOUR BUSINESS ON **\$43.00!**



Install . Service .
Find and Fix Leaks
with the

PREST-O-LITE Refrigeration and Air Conditioning Outfit

This single compact kit costs only \$43, yet contains every essential piece of equipment for your work. You get three interchangeable open-flame stems to provide the right air-acetylene flame for soldering, brazing, or heating. Fit the sensitive leak detector stem to the same torch handle, and you can pinpoint the tiniest halide gas leaks—as little as 100 parts in 1,000,000 parts of air. Compare that with soapy water!

In one sturdy carrying case, the kit also includes an adjustable gas pressure regulator, torch handle, and hose—everything for the installation, repair, and everyday maintenance of all types of refrigeration and air conditioning systems. See your local Prest-O-Lite dealer. Or write Linde Company, Division of Union Carbide Corporation, 270 Park Ave., New York 17, N.Y.

**LINDE
COMPANY**

**UNION
CARBIDE**

"Linde," "Prest-O-Lite," and "Union Carbide" are registered trade marks of Union Carbide Corporation.

circle 48 on reader service card

DO YOU SELL ICE MACHINES?

Here's how **Follett** can help you:

NEW 1961 LITERATURE with proven method of choosing most efficient, most economical ice machine—storage bin combination.

READY FOR DELIVERY—every size Follett bin in stock ready for immediate shipment from our distributors.

FOLLETT QUALITY—best construction and design on the market give trouble-free longtime service.

FOLLETT
ICE STORAGE BINS

Capacities from 250 to 5,000 pounds

MODEL NO. 50



for information and literature write:

ROY FOLLETT CORPORATION

99 Broad Street, Phillipsburg, N.J. Phone GL 4-8511

Dept. 10

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THE REFRIGERATION & AIRCONDITIONING BUSINESS/MAY 1961

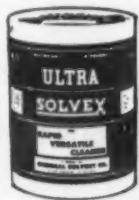




Ultra Solvex is safe!

So safe you can throw gloves away forever... yet strong enough to handle the hardest cleaning jobs. That's ULTRA SOLVEX, the quality cleaner that costs a little more per pound, but is less expensive in the long run. Why? Because ULTRA SOLVEX keeps doing the tough cleaning jobs... better... even after other products have lost their effectiveness. Look for it. SAFE, FAST, EFFECTIVE ULTRA SOLVEX.

CHEMICAL SOLVENT CO.
BIRMINGHAM, ALABAMA



ASK
YOUR
WHOLESALE

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98

Product DATA

Continued from page 97

pivoted to adjust from fully open to fully closed position. Automatic fusible link mechanism to close blades in case of fire available. A frame may be specified to allow louver to be removed and replace for cleaning and disinfection. Is sound absorbing and treated with acoustical barrier bonded to underside of sightproof blade and reduces transmitted sound. Protects against extraneous light leakage yet permits free air passage into rooms. Has opposed channel extruded blades and in two blade styles and frame sizes.

circle 174 on reader service card

Low temperature freezer

Product: "Cryostar" series of freezers that provide temperatures as low as -200 F.

Manufacturer: Instrumentation Associates, Inc., N.Y., N.Y.

Features: Have an adjustable temperature range control and suited for laboratories, factories, or wherever low temperature storage or quick freezing required. A 1 1/2 cu.ft. capacity unit available, although other sizes built upon request. Have vapor proof cabinet con-

structed of heavy duty steel insulated with glass fiber bats. Hard rubber double-lid doors centered on top of units. Refrigeration system has two hermetically sealed compressors in a 2-stage system. First stage is 1/2 hp motor with second utilizing a 1/4 hp motor. Air cooled units have permanently lubricated fan motor. Are 38 x 28 x 38" and weigh 435 lb.

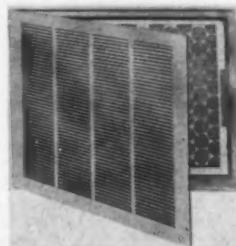
circle 175 on reader service card

Filter grille

Product: Filter grille with hinged frame and greater free area.

Manufacturer: Auer Register Co., Cleveland, Ohio.

Features: Has face bars stamped 1/8" wide on a 1/4" center and a 30-degree



deflection to eliminate visibility of filter surface and permit installation with deflection either up or down. Filters recessed about 1" behind grille face to provide greater efficiency and utilization

Continued on page 100

DRIERS DRIERS DRIERS

Refrigeration Research offers a high quality line of driers for every need....in a complete size range. All Refrigeration Research driers contain proven filtering media and are generously sized.

Bull Dog Progressive Filter-Driers



Your choice - Silica Gel or Molecular Sieve desiccant. Bull Dog Filter-Driers feature progressive filtering.... retain a maximum amount of moisture, dirt and foreign matter without showing increased pressure drop. Low in cost and high in quality....specify the Bull Dog line....in the drying agent of your choice.

Deluxe Dehydrators

Deluxe dehydrators feature all brass construction and extra large fittings. Containing Silica Gel desiccant, they are available in either refillable or non-refillable sizes.

Driers - Receiver Driers - Receivers
Accumulator Driers - Accumulators
Suction Accumulators - Manifolds
Heat Exchangers - Strainers
Mufflers

Write for current catalog or
contact your wholesaler.



REFRIGERATION RESEARCH

100 E. GRAND RIVER BEAUMONT, MICHIGAN

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NEW LOW-COST

Dust-ban FILTER

The electrostatic action of Skuttle Dust-ban Filters guarantees the removal of dust, dirt and pollen particles, yet allows the free flow of air for maximum heating or cooling efficiency. They are completely washable and never need oiling. 6 popular sizes, \$4.95 each.



FREE

Filter Gage (value \$1.95) is your tie-in for increased sales. Your customers will receive a free Skuttle filter gage with the purchase of 2 Skuttle Dust-ban Filters or \$1.00 with the purchase of 1 filter.



Skuttle-Aire Washable Filters. Designed for heavy-duty domestic, commercial and industrial applications. These sturdily built filters are easily washed with cold water and never need oiling.

Write today for
complete information.



Skuttle MANUFACTURING CO.
Milford, Michigan

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2 7 12 17 22 27 32 37 42 47 52 57 62 67 72 77 82 87 92 97 102 107 112 117 122 127 132
3 8 13 18 23 28 33 38 43 48 53 58 63 68 73 78 83 88 93 98 103 108 113 118 123 128 133
4 9 14 19 24 29 34 39 44 49 54 59 64 69 74 79 84 89 94 99 104 109 114 119 124 129 134
5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130 135

PRODUCT DATA

136 143 150 157 164 171 178 185 192 199
137 144 151 158 165 172 179 186 193 200
138 145 152 159 166 173 180 187 194 201
139 146 153 160 167 174 181 188 195 202
140 147 154 161 168 175 182 189 196 203
141 148 155 162 169 176 183 190 197 204
142 149 156 163 170 177 184 191 198 205

USEFUL LITERATURE

206 213 220 227 234 241 248 255 262 269
207 214 221 228 235 242 249 256 263 270
208 215 222 229 236 243 250 257 264 271
209 216 223 230 237 244 251 258 265 272
210 217 224 231 238 245 252 259 266 273
211 218 225 232 239 246 253 260 267 274
212 219 226 233 240 247 254 261 268 275

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Architect Contractor-dealer
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Other: _____ (specify) _____

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138 145 152 159 166 173 180 187 194 201
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141 148 155 162 169 176 183 190 197 204
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208 215 222 229 236 243 250 257 264 271
209 216 223 230 237 244 251 258 265 272
210 217 224 231 238 245 252 259 266 273
211 218 225 232 239 246 253 260 267 274
212 219 226 233 240 247 254 261 268 275

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You're ahead when you take time to find out what's new in refrigeration and air-conditioning.

Get the latest information that will make your business more efficient.

THE REFRIGERATION & AIRCONDITIONING BUSINESS invites you to use the handy reply cards attached to this form.

Fill out the card completely, circle numbers below the items you want more facts about, drop the card in the mail. We will do the rest.

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Reader Service Card

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NO POSTAGE STAMP NECESSARY IF MAILED IN THE UNITED STATES

POSTAGE WILL BE PAID BY:

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IT'S
FREE

"Here's why I standardized on H&M cooling towers

...they're the only towers with a 20-Year Guarantee on the wetted deck surface!

"In my town, most air conditioning and refrigeration buyers prefer cooling towers for their installations. But local water conditions are pretty hard on the fill. Fungus and algae grow fast and furious—so fast that the accumulation actually blocks air flow and cuts tower capacity!

"After trying several makes, I standardized on H&M Cooling Towers. The wood fill is specially treated with creosote applied under pressure, and water plants and animals can't live on that! That's why the

Halstead & Mitchell towers carry a 20-Year Guarantee on the wetted deck against failure due to fungus attack or rotting."

If you want towers that will last, and need a minimum of care, you should find out about H&M towers. Call your local parts wholesaler or write for Bulletin EC-500 (Propeller Fan Towers, 3 to 150 tons) or Bulletin ECKB-601 (Centrifugal Fan Towers, 5 to 30 tons). Halstead & Mitchell Co., Dept. D-5 Bessemer Building, Pittsburgh 22, Pa.



Halstead & Mitchell

Cooling Towers • Air-Cooled Condensers • Air Handlers and Coils • Water-Cooled Condensers
Export Representatives: Sabal-Kielmann, Inc., 15 William St., New York 5, N. Y.



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THE REFRIGERATION & AIR CONDITIONING BUSINESS/MAY 1961

SAVE \$800

per year per truck

with Servis Recorders

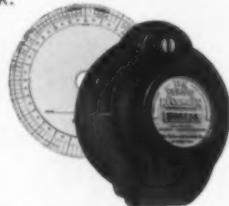


Automatic! Tamperproof!

Records Travel Time and Idle Time of Trucks

Here's the business-like way to check up on delays and overtime. It also gives you a basis for improving scheduling.

Many companies have bought these by the dozen and now have hundreds in daily use. Good drivers like the SERVIS RECORDER and its record of a good day's work.



Makes a clear record on permanent charts. No mechanical hook-up. You could nail it on and it would work! Various models available including a Speed Recorder.

Write for Literature

SERVICE RECORDER CO.

1015P Rockwell Ave. • Cleveland 14, Ohio
CHARTING OUR 2nd HALF CENTURY

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100

Product DATA

Continued from page 98

of filter surface. All standard 1" thick permanent or replaceable filters can be used. Produced in bufftone stock and available in all standard stock and non-stock sizes.

circle 176 on reader service card

Refrigeration controls

Product: A40 cycling control and A42 constant cut-in control.

Manufacturer: Ranco Inc., Columbus, Ohio.

Features: With A40, varying temperatures on power element capillary or bulb change internal pressure and height of bellows. This causes movement within control mechanism which rotates toggle lever to operate switch, which opens on a decrease in temperature. Standard element is vapor-pressure filled and bellows responds to coldest point on tube or bulb. Operating limits from -24 to 71 F with available temperature differentials from 8 F minimum to 66 F maximum. The A42 assures frost-free operation since compressor cycles each time evaporator temperature reaches control warm constant cut-in temperature. Temperature operating limits from -24 to 71 F

and temperature differentials from 12 F minimum to 66 F maximum.

circle 177 on reader service card

Chemical descalers

Product: Two sulfamic acid base cleaners that clean scaled equipment.

Manufacturer: Power Chemicals Div., E. F. Drew & Co., Inc., N.Y., N.Y.

Features: "Improved Saf-Acid" is a fast acting powdered scale remover inhibited to prevent corrosion and foaming. "Saf-Acid C" is specialized acid cleaner that is safe for use in systems containing galvanized metal.

circle 178 on reader service card

Airconditioner-radiator

Product: "Vectormatic" combination thru-the-wall airconditioner and convector radiator.

Manufacturer: Fedders Corp., Massapequa, N.Y.

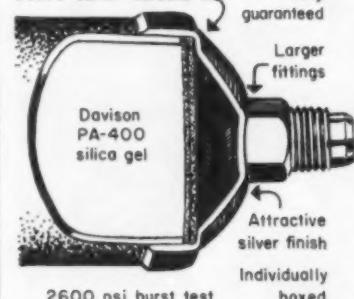
Features: Seventeen chassis, with cooling capacities from 6000 to 13,500 Btu, available. Heating element has aluminum fins with die-formed collars bonded to internally expanded $\frac{1}{2}$ " copper tubing. Wall sleeve, convector cabinet and heating element, and airconditioner chassis packaged separately. Also features chassis levers, condensate overflow drains, and four-square strut which

Continued on page 102

ECONO-LYNE is now lowest priced dryer

Double outlet screens

Fully guaranteed



HIGHEST VALUE TOO—
Special design and modern equipment have made this exceptional quality dryer lowest priced. 4 to 30 cu. in. capacities. 520 psi working pressures.

Write for complete information and prices.

WABASH CORP.

2300 S. Western Ave., Chicago 8, Ill.
EXPORT DEPT.

13 E. 40th St., New York 16, N.Y.

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- Dry Chemical
- No Fumes
- No Corrosion
- Fast Acting
- Safe to Handle
- Easy to Use
- Inexpensive

Buy ANCO for sure profits
Condenser Cleaner—Water Treatment—Algaecide



Anderson

Chemical Company, Inc.

Bax 1424 • Macon, Georgia

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MAY 1961/THE REFRIGERATION & AIR CONDITIONING BUSINESS



**THE
McQuay
REFRIGERATION
LINE IS COMPLETE**

an outstanding unit for
every requirement

Whatever your refrigeration requirements may be, you will find a McQuay unit to exactly meet your needs. And, every unit is tops in its field due to McQuay's incomparable manufacturing and engineering know-how, coupled, of course, with the famous McQuay Ripple-Fin coils for highest performance and efficiency. In addition to the unit coolers shown here, the McQuay line includes electric and hot gas defrost systems, gravity coils, product freezers and product coolers, residential evaporators, fan coil units, large capacity air conditioners and the popular Aircon air cooled condensers. All are available in the widest possible range of sizes and capacities, and are very favorably priced for quality products. For complete information, see your refrigeration wholesaler, or write McQuay, Inc., 1643 Broadway N. E., Minneapolis 13, Minnesota.



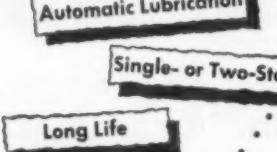
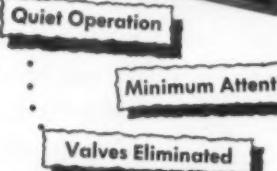
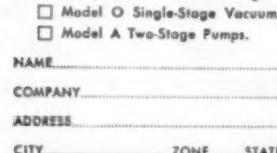
AIR CONDITIONING • HEATING • REFRIGERATION

Servicemen Agree...

BEACH-RUSS PORTABLE VACUUM PUMPS

are made with features they desire

High Performance Characteristics

- Completely Portable
- Automatic Lubrication
- Single- or Two-Stage
- Long Life
- Quiet Operation
- Minimum Attention
- Valves Eliminated

Beach-Russ Vacuum Pumps are also made in types and sizes for evacuation and testing of refrigeration equipment on a production basis.

BEACH-RUSS COMPANY
620D GRAYBAR BLDG., NEW YORK 17, N.Y.

Send descriptive literature covering
 Model O Single-Stage Vacuum Pumps.
 Model A Two-Stage Pumps.

NAME.....

COMPANY.....

ADDRESS.....

CITY..... ZONE..... STATE.....

BEACH-RUSS CO.
620D GRAYBAR BUILDING
NEW YORK 17, N.Y.

circle 18 on reader service card

102

Product DATA

Continued from page 100

supports sleeve. Also has triple draft barrier, removable outdoor metal protection plate and louvers, and temporary front sealer plate.

circle 179 on reader service card



Auto airconditioners

Product: 1961 line of "Frigiking" auto airconditioners (Models F-104, U-2, "Corvair Special", UD Standard).

Manufacturer: Frigikar Corp., Dallas, Texas.

Features: Available for 268 makes of cars including 1961 and back to 1952 models. Model F-104 specially for compact cars; U-2 for standard and luxury cars; "Corvair Special" has self-contained, fanned-air condenser; and UD Standard delivers air by bladed turbofan or twin-air rotor.

circle 180 on reader service card

Liquid level gage

Product: "Gage-O-Matic" liquid level indicating gage.

Manufacturer: H. H. McKinnies Co., Milwaukee, Wis.

Features: Available with single or mul-

iple control switches for automatic operation of pumps, valves, indicator lights, alarm bells, compressor shutdown, and signal circuits direct to protective organizations. Has five major parts—float chamber, guard section, control switch or switches, combination float ball, rod and magnet-indicator, and indicator glass. Float chamber connected by bottom and top equalizer to vessel. Variations of liquid level in vessel cause level change in float chamber where float ball moves up and down with level changes and causes float rod with indicator-magnet to move inside indicator glass. Magnet also serves as actuating force which operates control switches.

circle 181 on reader service card

Electric motor relays

Product: Complete line of relays for control of small, self-protected electric motors up to $\frac{1}{2}$ hp (Form CRI2OE).

Manufacturer: General Electric Co., Schenectady, N.Y.

Features: Rated at 600 v. and available with 6, 12, 24, 115, 230, 440, and 550 v. coils, 60 or 50 cycles. Adaptable for use as start winding cut-out function on capacitor start motors up to 3 hp at 115 v. or 5 hp at 230 v. In NEMA Type 1 enclosure.

circle 182 on reader service card

Compact humidistats

Product: Compact humidistats for control of humidifier and dehumidifier units (Models J10, J11).

Manufacturer: Ranco Inc., Columbus, Ohio.

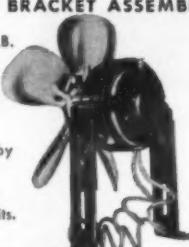
Features: Respond to atmospheric moisture content within confined area to automatically cycle humidifying or dehumidifying equipment. Available in two series of controls that activate or stop unit to compensate for increase or decrease in humidity. Have two selective locations of dial shaft, adaptation to line voltage or pilot duty usage, snap-action switch, long-lasting power element. J10 dial shaft centered between mounting holes on side of control while J11's shaft located at one end of control, 90 degrees from mounting surface. Both controls are designed to operate within 20 to 80% humidity range.

circle 183 on reader service card

AN ADJUSTABLE REPLACEMENT FOR HERMETIC UNIT CONDENSER FAN ASSEMBLIES

THE TRANS AIRE MOTOR FAN BRACKET ASSEMBLY

The Transaire M.F.B. provides a single stock, all purpose solution to the replacement problem created by the great variety of condenser fans on all hermetic units.



- ADJUSTABLE TO WIDE VARIETY OF MEASUREMENTS—POSITIVE LOCKING AT ANY POSITION
- PERMITS USE OF ORIGINAL MOUNTING HOLES WITHOUT REFERENCE TO MODEL OR CATALOG NO.
- IMPELLER FAN AVAILABLE IN 4 DIFFERENT SIZES
- DUST PROOF MOTOR, RUBBER MOUNTED
- GUARANTEED FOR ONE YEAR

Write for details and prices (Give your wholesaler's name)

TRANS AIRE MFG. CO.

Div. of Penn Electric Motor Co., Inc.
3080 Emerald St., Philadelphia 34, Pa.

circle 82 on reader service card

MAY 1961/THE REFRIGERATION & AIRCONDITIONING BUSINESS

Modern advanced time controls

FOR COMMERCIAL
DEFROSTING
BEGIN HERE



IN PARAGON'S DYNAMIC ENGINEERING DEPARTMENT



8010



8100



600



8200

• **8010 SERIES** — Defrost cycles can be adjusted from 2 to 110 minutes. Bulletin 5947.

• **8100 SERIES** — Defrost cycle automatically ended when built-in solenoid is activated by either remote thermostat or pressure switch. Bulletin 5848.

• **600 SERIES** — For systems which require a timed fan delay or drain period at end of defrost cycle. Bulletin 5945.

• **8200 SERIES** — Length of defrost cycle determined by pressure increase. Bulletin 5949.

Well aware that commercial refrigeration is a rapidly developing industry, Paragon design engineers consistently aim at creating only the most advanced defrost controls.

They take great pride in helping uphold Paragon's long tradition of leadership in the manufacture of quality controls. And their extensive experience, keen skills, and abundance of new ideas are particularly reflected in the 8010, 8100, 8200 and 600 Series — the finest, most up-to-date controls in commercial refrigeration today. Another design job well done!

PARAGON

ELECTRIC COMPANY

1827 TWELFTH STREET • TWO RIVERS, WISCONSIN



Time is money...control it with Paragon

circle 61 on reader service card

CRITICAL TEMPERATURE

Continued from page 47

The reheat coil water circuit is much different. A domestic water mixing valve mixes hot water directly from the building boiler with return water from the reheat coil. This provides nearly constant-temperature hot water to one port of the reheat 3-way automatic mixing valve.

Return water from the reheat

coil goes to the other inlet port of the automatic valve. Constant flow is maintained through the reheat coil from the 3-way automatic mixing valve. Temperature of water entering the reheat coil is varied as required by a return air thermostat resetting a discharge controller which positions the reheat 3-way automatic mixing valve. Since air entering the reheat coil and room requirements do not appreciably vary, nearly constant hot water is supplied to the coil

and nearly constant-temperature air is supplied to the room.

Needs precise distribution

Very precise supply air distribution is attained through ceiling type perforated panels. Return air is removed through several grilles under work benches around the perimeter of the room. This precise air distribution and thorough mixing is essential to the performance of the system.

Both the inspection room and the production room are cooled by standard packaged direct expansion airconditioning units. The 68 F plus or minus 1 degree dry bulb is maintained by hot water reheat coils with piping arrangements, 3-way valves, and thermostats the same as used in the laboratory system.

Entire building is cooled

There's a 5-ton unit for the inspection room, 10 tons for the production area. The rest of the plant, including general offices, are kept at normal comfort conditions. Several window units are used, in addition to packaged water and air-cooled airconditioning units. There are 45 tons of airconditioning in the entire building.

Equipment for the critical inner lab and inspection room is in the boiler room. Production area airconditioning equipment is in the room itself. ♦



WHATEVER YOUR LOW-TEMPERATURE INSULATION NEEDS UNITED CAN SERVE YOU

From engineering design to final installation in CORKBOARD or EXPANDED POLYSTYRENE

United's patented process BB Corkboard is the long established, job tested insulation material. Block baked of 100% cork with no fillers or binders, it has a low K factor, is fire retardant, insect and vermin resistant.

Equally effective is Uni-Crest expanded polystyrene, United's newest development in insulation materials. This modern, lightweight, snowy white material, composed of minute, individually closed cells, has a low K factor, low moisture absorption, and retains its insulating value indefinitely. It is strong, flexible, easy to handle and inexpensive.

Experienced engineers, at United's branch offices coast-to-coast, offer complete consulting and design ser-

vice on both cork and Uni-Crest installations. Each installation is specifically planned to meet requirements of the job. Skilled crews, working out of these same offices, carry out the entire job of erecting insulation under direct supervision of engineers responsible for the design. In this way you are assured of undivided responsibility for performance of the entire installation.

Both Cork and Uni-Crest are available in a wide variety of sizes in board and pipe covering form. In addition, United provides cork lagging and discs for tank and filter application, as well as a self-extinguishing board and pipe covering of Uni-Crest. Write for more complete information.



UNITED CORK COMPANIES

Since 1907

7 Central Avenue, Kearny, New Jersey
Branch offices or approved distributors in all key cities
circle 101 on reader service card



It'll be kool in Kuwait

Kuwait, an Arab state on the Persian Gulf, is buying 3000 room coolers. This will give the country one room airconditioner for every 16 persons, highest ratio in the world.

Westinghouse Electric Corp. is filling the order for Kuwait, reputed to be the richest nation in the world per capita because of revenue from its oil fields.

Temperatures in the country go above 100 during the summer. Annual rainfall is less than five inches. Coolers are designed for continuous operation and must deliver room temperatures no higher than 80 F with relative humidity no more than 50%, even when outdoor temperatures reach 122.

Wholesaler ACTIVITIES

Idea for mobile soda fountain clicks for resourceful wholesaler

In looking for a new way to move counter freezers, wholesaler Chester E. Borden incorporated them into a more saleable product—a mobile soda fountain for selling soft ice cream.

Borden is president of A. E. Borden Co., Inc., veteran airconditioning and refrigeration wholesalers in Boston, Mass. Borden's new company, formed to manufacture the mobile unit, installs all refrigeration and airconditioning equipment and contracts for the other work. He sells the finished product to independent refrigeration dealers or restaurant equipment distributors.

Borden told us he sold a couple of these trucks in 1958 while acting as a distributor for another manufacturer. Then, in 1959, he started producing his own.

"Our men were familiar with these counter freezers, because we have been handling them for years. Our men designed our trucks, drawing their own floor plans and electrical diagrams, improving on models already on the market."

Trade name for the trucks is "Frosty."

Builds onto standard body

How's the truck put together? Bomerco buys a standard chassis and has it shipped to a body builder in Pennsylvania. He installs a retail merchandiser body. When the truck arrives in Boston, Bomerco adds refrigeration and airconditioning equipment. Local contractors install windows, lighting, stainless steel inside panels, pumps, and the electrical system.

At first Bomerco used window airconditioners to cool the trucks. These units did not provide enough cooling and they threw heat to the rear of the truck, heating the refrigerant there.

Now a high-velocity centrifugal

blower from 2½ tons of airconditioning sends cool air into the driver's area, completely cooling the remaining interior. By heavily insulating the equipment compartment from the work area, the airconditioning load is greatly reduced and the driver is more comfortable. Bomerco also insulated the water storage tank to protect from equipment compartment heat.

Work area is cooled

A centrifugal fan draws warm air from the floor of the work area through a permanent filter under the sink compartment. This warm air discharges over the cooling coil. Air brought up the wall between the equipment compartment and the work area discharges through 4-way directional louvers into the work area.

A remote compressor refrigerates a large undercounter storage cabinet that holds ice cream mix, in-



stant whip, and other perishables at the proper temperature. It also refrigerates the underside of the fruit and syrup rail.

A thermostatically-controlled generator powers the refrigeration during the day. The electrical system also will run off plug-in outside power.

"We sell two models," explained Borden. "The 10' model is on a 4-wheel chassis; the 12' model has dual rear wheels. Several standard features on the larger truck are optional on the 10' vehicle."

Burnworth new president

Dewey Burnworth has been appointed president of Yucca Wholesalers, Inc., Albuquerque, N.M., located at 2220 First St., N.W.



SERVICE SCHOOLS continue to prove themselves as a major sales building tool, according to Harold McCombs, McCombs Supply Co., Denver, Colo. John Zent of Copeland Refrigeration Co. (at right on rostrum) directs this school covering emergency diagnosing and repair of hermetic unit electrical components. With just a mailed announcement of these meetings to 120 refrigeration service firms and contractors, McCombs' schools attracted 52 in Cheyenne; 92 in Pueblo, and 185 in Denver. All Refrigeration Service Engineers Society members in each area attended. In addition to meeting many new men in the commercial refrigeration field, McCombs built up a mailing list of more than 300 active prospects through his school program.



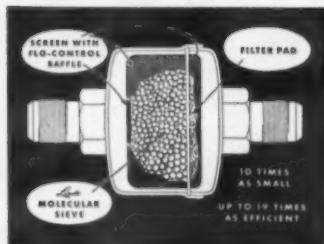
**...How TMC
MOLECULAR SIEVE
FILTER-DRIERS**

Increase Sales and Profits

for YOU . . . From original equipment to replacement, you save space, inventory, installation costs and call-backs when you use TMC Filter-Driers.

1. Five sizes cover entire range up to 15 tons.
2. Largest size fits palm of your hand.
3. Save space in refrigeration and air conditioning system design.
4. Simplified line simplifies ordering, stocking and handling.
5. Bulletin 1157 covers Moisture Removal, Filtration, Acid Removal and Low Pressure Drop.

Write for TMC Facts and Prices



**TUBE MANIFOLD
CORPORATION**

415-RAC5 Bryant Street • N. Tonawanda, N.Y.

*Another Product of the World's Leading
Manufacturer of Liquid Receivers*
circle 93 on reader service card

106

BUSINESS Briefs

Continued from page 12

**Brownlee receives car
as top sales manager**

Top district sales manager for Stewart-Warner Corp.'s heating and airconditioning division is J. G. Brownlee, 19-year veteran in the division's service department.

Brownlee celebrated his first year as district sales manager in central Indiana by producing the greatest sales increase over quota in the division's 11-month Star Salesman Contest. He received a convertible for his efforts.

Other winners, in order of standing, were Wilbur Fites, Ohio; Richard M. Fuller, northern Indiana; Henry G. Gable, Pennsylvania; Maurice J. Smith, northern New Jersey; Robert J. Skarda, Long Island, and Robert J. Shue, southern Indiana and Ohio.

Continued on page 108



Install Insulation with

TUFF-BOND

Super-Strength Adhesives

TUFF-BOND #7
... fire-retardant adhesive for installing insulation

TUFF-BOND M-102-H
... duct liner adhesive

TUFF-BOND 21-C
... clear lap sealer and lap adhesive

TUFF-BOND 21-W
... white lap sealer and lap adhesive

TUFF-BOND #6
... non-flammable fire-retardant duct liner adhesive; meets Interim Federal Standard #00136.

TUFF-BOND #9
... for bonding rigid and semi-rigid plastic foams (polystyrene, urethane, isocyanate, etc.) to themselves and to other materials.

TUFF-BOND #12
... high pressure duct sealer

TUFF-BOND QUIK SET
... neoprene-base, fast-setting adhesive. Recommended for installing metal and nylon hangers to smooth surfaces.

TUFF-BOND GENERAL PURPOSE IMPROVED
... all-around adhesive for installing insulation, insulation hangers, etc.

Ask for literature and prices.

GOODLOE E. MOORE
INCORPORATED
DANVILLE 27, ILLINOIS

circle 55 on reader service card
circle 83 ▶



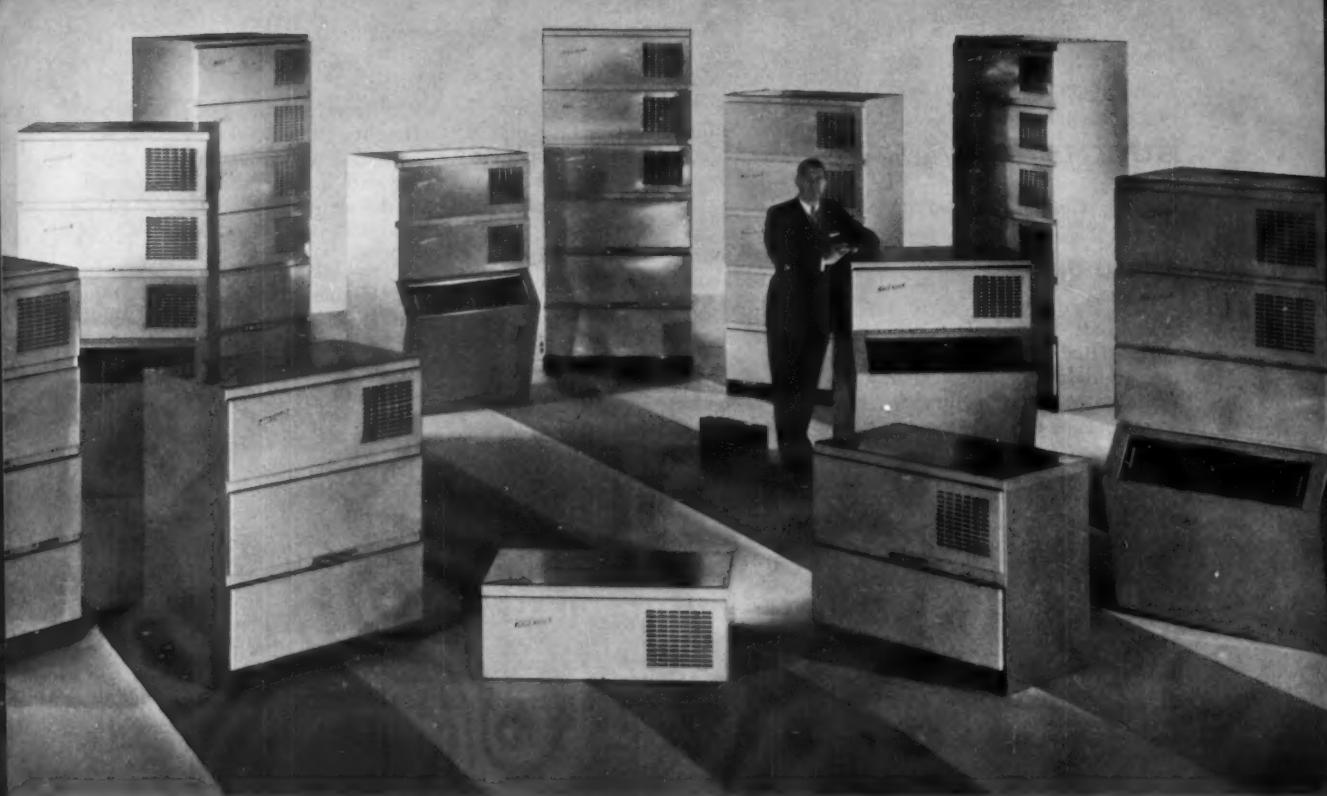
*With The
Low Silhouette*

Efficiency, economy, dependability—those three words most effectively describe the operation of Witt Air Cooled Condensers. Available in a wide range of centrifugal blower and fan type models, for single or multiple compressor installations, for indoor or outdoor applications, you'll find a Witt Air Cooled Condenser to handle any size air conditioning or refrigeration system. Winter control systems available for low temperature areas—multiple circuiting available at no additional charge.

Write For Complete Witt Catalog

A. H. WITT COMPANY, INC.
940 N. Sycamore Ave., Los Angeles 38, Calif.

circle 90 on reader service card



SHOWN: A few of the tremendous line of 120 Kold-Draft ice cubers.

120 Different models to choose from... Only by *KOLD-DRAFT

• ALWAYS A PERFECT CUBE
... CLEAR ... PURE ... SOLID

• COMPLETELY FLEXIBLE
... ADD-A-UNIT FEATURE

• GUARANTEED
CAPACITY RATINGS

The unique Add-A-Unit feature of Kold-Draft ice bins and ice cubers afford unsurpassed flexibility in ice making and bin capacity, and allows expansion of either or both as your business grows . . . automatic ice crusher is available for most models . . . its compactness permits use where space is extremely limited . . . all models available in beautiful Pearlstone grey baked-on vinyl enamel or stainless steel . . . air cooled, combination air/water, or straight water . . . a model to fit all requirements whether large or small . . . send coupon for full information.

*TRADEMARK REG. U.S. PAT. OFF.

KOLD-DRAFT DIVISION

©1961 UNIFLOW MFG. CO.

UNIFLOW MANUFACTURING COMPANY • ERIE, PENNSYLVANIA

A complete
line of
refrigeration
products
from
ONE
reliable
source



WATER
COOLERS



BEER
DISPENSERS



BEVERAGE COOLERS



SOFT DRINK
DISPENSERS



WALK-IN COOLERS



KOLD-VUE
BEVERAGE
MERCANDISERS

TOM MARTIN, Sales Manager
KOLD-DRAFT DIVISION
UNIFLOW MANUFACTURING COMPANY
ERIE, PENNSYLVANIA

YES, we are interested in distributing Kold-Draft ice cubers . . . please send complete literature and prices.

NAME _____

FIRM _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

See us at Booth 717-719 National Restaurant Show

BUSINESS Briefs

Continued from page 106

EXPANSIONS

Pennsalt Chemicals Corp. has consolidated its sales technical service groups to expanded laboratory facilities in King of Prussia, Pa. These groups formerly were in two

separate locations. The new 2-story building is the first unit to be completed in Pennsalt's planned \$6 million technical center.

Baltimore Aircoil Co., Inc., has started construction on a 40,000-sq.ft. addition to its plant.

Permatron Corp.'s fourth major expansion has moved the firm into new and enlarged facilities at 666

E. Kensington Rd., Arlington Heights, Ill. Several new items will be added to Permatron's line, starting with a heavy-duty professional model air purifier.

New laboratories for research, development, and data verification will be completed soon by Cobell Industries, Inc. The new facilities will speed the development and testing of new airconditioning and heating equipment.

SALES FIGURES

Bell & Gossett Co. reported record sales for the year ending Nov. 30, 1960, but a slight decline in earnings as a result of higher material and labor costs. Net sales reached \$30,933,431, tops in the firm's history, up more than \$1.1 million.

Lower sales were reported by Mueller Brass Co. and its subsidiaries for the fiscal year ending Nov. 30, 1960. Sales dropped more than \$8.5 million.

NAMED TO REPRESENT

Carrier Air Conditioning Co., Div. of Carrier Corp.—General Heating & Cooling Co., Kansas City, Mo., for northern and eastern Kansas, western Missouri, and parts of Arkansas.

McIntire Co.—Donald J. Jessup, Danville, Ill., covering Indiana, Illinois, and Wisconsin.

Drayer-Hanson Div., Hi-Press Air Conditioning of America, Inc.—A-T-M Equipment Co., Inc., Jackson, Miss.

Ilg Electric Ventilating Co.—C. W. Dean & Associates, Memphis, Tenn., for that city.

Savage Ice Cream Cabinets—Heerema Co., Paterson, for New Jersey and part of New York State, and M. G. Newell Co., Greens-

The advertisement features a large, ornate crown positioned above a vintage-style thermometer. The thermometer has a circular dial with scales for "F-22 PRESSURE" and "R-22 PRESSURE". Below the thermometer is a small open box containing various tools or components. A tag attached to the thermometer reads "The Always Dependable Serviceman Thermometer".

Also available in Standard Model with single scale.

MARSH *Refrigeration Instruments*

Gauges • Thermometers • Valves

circle 50 on reader service card

boro, for North and South Carolina.

General Air Products Corp.—*Jim Marshall Co.*, San Antonio, Texas, for that area, and *Robert Schwarz Co.* for Illinois.

Armour Industrial Chemical Co.—*McKesson & Robbins, Inc.*, Pittsburgh, covering western Pennsylvania and northern West Virginia; *Thompson-Hayward Chemical Co.*, Shreveport, La., in that city.

Recold Corp. for airconditioning products—*Holland Equipment Co.*, San Antonio, Texas; *Travers Sales Co.*, Virginia Beach, Va.; and *Ralph S. Beeson Co.*, Kansas City, Mo.

Modine Mfg. Co.—*George Knowlton & Associates*, Atlanta, Ga., for that area; *Grant H. Jacobson*, Dallas, covering northern Texas.

LaCrosse Cooler Co.—*Mike Gary Parker*, St. Petersburg, as manufacturer's representative for commercial refrigeration in Florida and Georgia.

Typhoon Air Conditioning & Typhoon Heat Pump Divisions, Hupp Corp. for airconditioning and heat pumps—*J. A. Walsh & Co.*, Houston, Texas, in that city.

Lehigh Mfg. Co.—*R. L. Williams & Co.*, Oklahoma City, covering Texas, Oklahoma, Arkansas, and Kansas.

Welbilt Air Conditioning and Heating Corp.—*Universal Appliance Sales, Inc.*, Boca Raton, Fla.; *Century Refrigeration Supplies, Inc.*, St. Louis, Mo.

Perfection Div., Hupp Corp.—*Capitol Supply Co.*, Jefferson City, Mo.; *C. L. Miley Co.*, Indianapolis, Ind.; *Braid Electric Co.*, Nashville,

Tenn.; *Hart, Inc.*, Minneapolis, Minn.; *Otten Heating Co., Inc.*, Buffalo, N.Y.; *J. A. Walsh & Co.*, Houston, Texas; *Central Air Conditioning, Inc.*, Memphis, Tenn.; *Dunbar Metal & Supply Co.*, Charleston, W. Va.

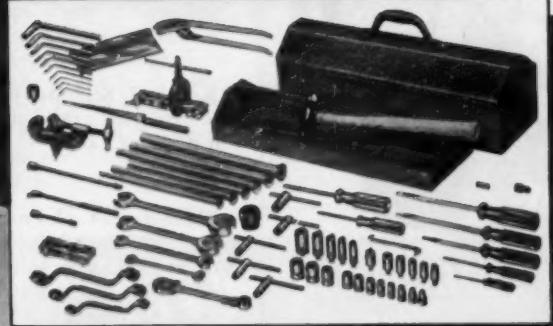
Bendix-Westinghouse Automotive Air Brake Co., Evansville Div. for condensing units and motor compressors—*Universal Cooler Co.*, Barrie, Ontario, for Canada east of British Columbia.

Connor Engineering Corp.—Airfoil Products Corp., Chicago, covering northern Illinois, northwestern Indiana, and Wisconsin.

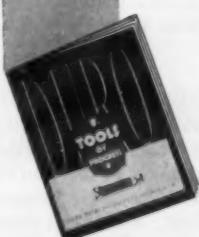
York Div., Borg-Warner Corp.—Funderburgh Co., Wichita, covering western Kansas.

Southwest Mfg. Co.—Waugh Bros. Supply Co., Oklahoma City, covering Oklahoma and the Texas Panhandle.

The most widely used REFRIGERATION SERVICE TOOLS!



Duro-Chrome "Matched Quality" Sets developed especially for refrigeration service



More refrigeration service men use DURO-CHROME tools than any other make! That's because they're quality tools that feel right, work right, and give long, satisfactory service. They're matched, too, with the natural grip and perfect balance that makes them feel "at home" in your hands. Whether it's the Duro-Chrome Refrigeration Ratchet Wrench, Flare Nut Wrenches, Socket Sets, or any of the many other Duro-Chrome Tools specially designed for refrigeration service jobs, your wholesaler has them all. For the most complete line of Refrigeration Service Tools, get your copy of the new Duro-Chrome Pocket Catalog that fits your pocket or your kit.

SEND FOR CATALOG—Ask your Duro Jobber for a free copy, or send coupon to DURO, with 10c in coin to cover costs of postage and handling.

DURO

DURO METAL PRODUCTS CO.
2449 N. Kildare Ave., Chicago 39, Ill.

DURO METAL PRODUCTS COMPANY
2449 N. Kildare Ave., Chicago 39, Ill.
Enclosed is 10c in coin for which please send me
my personal copy of the Pocket Size Duro-Chrome
Catalog.

Name _____

Address _____

City _____ Zone _____ State _____

Also makers of nationally advertised DURO Power Tools.

circle 100 on reader service card

Easy as 1-2-3
to install the
Temprite
Bantam-100
CARBONATOR



Why pass up steady big-time carbonator business? Easy as 1-2-3 to install—the Bantam-100 takes no time at all! Just 3 simple connections, hook up the power, and the mighty little Bantam-100 is off and running—way out front in performance! It's fully automatic and worry-free! Let the Bantam join your sales force and watch the feathers fly!

TEMTRITE CARBO-COOLER
COOLS and CARBONATES from THE SAME UNIT! Delivers up to 300 glasses hourly! Compact replacement unit for cold drink vending machines, or wherever carbonated water is served. Famous Temprite instantaneous cooling principle and trouble-free service. Measures only $7\frac{1}{2}$ " O.D. x 15" height.



Manufactured under rigid quality control by
TEMTRITE PRODUCTS CORPORATION
BIRMINGHAM, MICHIGAN

Rush me details on Bantam-100 and Carbo-Cooler.
Name _____
Company _____
Address _____
City _____ State _____

circle 80 on reader service card

110

People ON THE MOVE

Continued from page 60

Dr. Richard B. Cuddeback becomes supervisor, market development for molecular sieves for Linde Co., Div. of Union Carbide Corp. Joseph P. Fris and Edward L. Clark are appointed regional sales managers, Fris for northeast area and Clark in southwest.

Arnold Kawsky becomes a room airconditioner district manager for Airtemp Div., Chrysler Corp. His territory is all of Ohio plus parts of Kentucky, Indiana, Michigan, New York, Pennsylvania, and West Virginia.

Joseph H. Schlessel is appointed executive vice president of Slant/Fin Radiator Corp.

Three district sales managers are named by Ebcō Mfg. Co. K. W. Rice covers Kansas, Missouri, Oklahoma, Arkansas, and southern Illinois; R. C. Immel for New Jersey, New York, and Philadelphia; and Paul W. Sullivan for Louisiana and parts of Texas.

William H. Lewis is appointed advertising and sales promotion manager for Albion Div., McGraw-Edison Co., replacing Robert Marbach. Lewis, with the division since 1955, was service manager.

William R. Rinelli and **Edwin D. Schlutter** are newly-elected officers of Ansul Chemical Co. Rinelli, general manager of the firm's chemical products division, is named vice president. Schlutter, director of corporate administrative services, is the new controller.

New manager of Kansas City, Mo., district office for Armstrong Cork Co.'s insulation division is Donald W. Kuhn. J. A. Crawford

moves up from salesman to become manager of division's new district office in Los Angeles, Calif.

Three district managers are named by Typhoon Air Conditioning Div., Hupp Corp. Douglas G. Peltz covers Missouri, Kansas, and southern Illinois; Ralph E. Rivers for Georgia; and George F. Hafkemeyer for Texas.

Robert S. Knowles is promoted to manager of the Chicago, Ill., sales office of Trane Co. He was formerly manager of the Greenville, S.C., office and is being replaced by Benny T. Bootle.

Ray Long is transferred from the Baltimore, Md., office to Detroit, Mich., sales office as branch manager for Ilg Electric Ventilating Co. Long was manager of the Baltimore office for six years.

Four sales representatives at Mueller Brass Co. are Daniel W. Prince, Cambridge, Mass., office; Bert N. Graham, Denver, Colo., office; Thomas L. Corden, Dallas, Texas, office, and Gerald A. Bowlers, Melrose Park, Ill., office.

CLASSIFIED ADVERTISING

Classified Advertising Rates: \$20 for first column inch; \$15 for each additional column inch or fraction. All classified advertising payable in advance.

EQUIPMENT FOR SALE

USED Duplex Vilter Ammonia Compressor, 278 ton capacity, 15" x 15" with synchronous Electric Machinery Co., 500 H.P. motor, G.E. switch gear, Motor generator set and 500 KVA transformer in very good condition. Available for approximately 30% of new price. For further information contact Mr. Sansome or Mr. Croysdale at: THE BEST FERTILIZERS CO., P.O. Box 198, Lathrop, California. Phone: Manteca, California, TA 1011.

BUSINESS OPPORTUNITIES

REFRIGERATION MEN, Get on your own. Refrigeration, air conditioning business for sale. Best of accounts, service contracts, and franchises. Excellent opportunity for two service engineers to get their investment back first year. Should net \$10,000 each year. Within 100 miles of Detroit. All correspondence confidential. Write Box 361, THE REFRIGERATION & AIR CONDITIONING BUSINESS, 812 Huron Rd., Cleveland 15, Ohio.

Two new vice presidents at Revere Copper and Brass are **Fritz C. Hyde**, assistant general sales manager, and **Harold C. Wilson**, sales manager, aluminum products. **John C. Emison, Jr.**, is new treasurer of the firm with **Walter R. Brent** as his assistant. Brent also is manager of Revere's foreign operations.

B. L. Lerch is promoted to sales manager of the oil and electric heat div., General Controls Co. **Robert C. Allen** moves into Lerch's former position as midwest regional manager.

Koch Refrigerators, Inc. appoints **John M. Gent** sales representative in Chicago-Milwaukee-Detroit area.

R. W. Lindsay, formerly director of marketing, is appointed vice president in charge of sales at C. A. Olsen Mfg. Co. He succeeds **Edward P. Hayes**, executive vice president.



G. Douglas Davis is appointed manager of new product and market development at Bastian-Blessing Co. He's been the firm's advertising manager for five years and is replaced by **Russell E. Owen**, formerly manager of marketing for Day-Brite Lighting, Inc.

Donald Flood is named industrial sales representative in western New York for National Lock Co.

General Air Products Corp. appoints **R. M. Williamson** as representative in the Dallas, Texas, area.

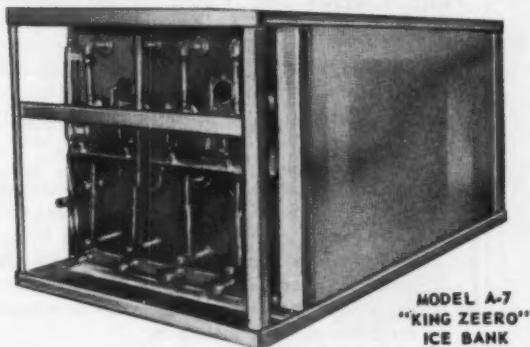
Daniel N. Gredys is promoted to general manager of Perfection Div., Hupp Corp. Gredys, with Perfection for 26 years, was previously vice president of engineering.

Pittsburgh Corning Corp. appoints **John H. Hartzell** and **John P. Kasurin** as new sales representatives. Hartzell will cover Colorado; Kasurin, Detroit, Mich.

Actor H. Patton is promoted from manager of product development to director for Allied Chemical Corp.'s General Chemical Div. He's been with the division 32 years.

Add a "King Zeero" ICE BANK to Your Refrigerating System for Effectual, Economical Air Conditioning

The "King Zeero" ICE BANK is designed to deliver 32° to 34°F. ice water for recirculation through air cooling coils in exactly the right amount when and where it is needed. It levels off "peak" and "valley" loads. Peak loads many times compressor capacity are easily handled. Ice Banks may be added to increase existing capacity. Refrigerant: Freon, Methyl Chloride or Ammonia.



CAPACITIES - 500 lbs. to 30,000 lbs. (72,000 B.T.U.'s to 4,320,000 B.T.U.'s) in a single unit. Multiple units may be installed.

The Patented Coils with Built-in Louvres opposed to the flow of water through the ICE BANK provide turbulence. This eliminates a mechanical agitator - insures all the water rubbing all of the ice. No upkeep or repair expense whatever.

The "King Zeero" Ice Storage System of water chilling has definite advantages over direct expansion, or other types of ice accumulators.

Saves power through smaller compressor requirement. Simple construction (no moving parts). Dependable in performance. Low operating and costs.

Let the ice stored during light loads take care of peak loads. The compressor need only handle the average daily load - not the peak.



THE KING ZEERO COMPANY

4300-14 W. Montrose Ave. - Chicago 41, Ill.

Manufacturers of Ice Builders - Ice Builder Cabinets - Ice Banks

circle 103 on reader service card

Build a 2-mile duct ...in one day!

MOST POWER
PER DOLLAR



"Pittsburgh-Lock" HAMMER

closes seams at
20 ft. per minute!

Save hours of time . . .
do every job right

Say goodbye to the only tedious, costly, time-consuming job of fabricating duct work . . . closing the seams, by using the MILWAUKEE "Pittsburgh-Lock" Hammer. With this powerful, smooth running tool, duct work seams are closed at the rate of 20 feet per minute, or faster. Perfect working balance. Handles 30 to 22 gauge sheet metal . . . straight runs, inside or outside radii. Saves half the man hours formerly required and does better, neater work . . . in the shop or on the job!

Ask your MILWAUKEE Distributor to
arrange a demonstration, or write . . .

Milwaukee Electric Tool Corp.
5310 West State Street • Milwaukee, Wis.

circle 53 on reader service card

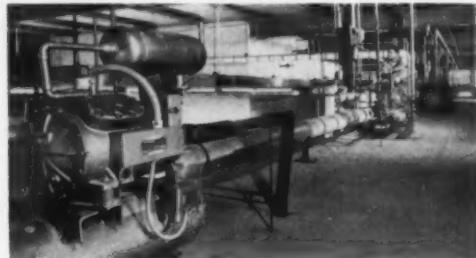


RECENT Installations

Continued from page 56

Split system ripens bananas

THE RIPENING OF BANANAS is controlled to prescribed time intervals at the Levin Banana Storage and Food Distribution Center, Philadelphia, Pa., by using a Dunham-Bush air-cooled split system that gives 28 rooms close temperature and humidity control. Eight of the rooms use 10 hp compressors with 20-ton air-



cooled blower condensers. Pressure stabilizers maintain operating head pressures during the winter.

Water-cooled 10 hp compressors and a 50-ton cooling tower are used for the other 20 rooms. All of the rooms are cooled and given even air distribution with horizontal air handling units. The installing contractor was Arthur Lehman, Inc., Vineland, N.J.

Tunnel dries and cools plywood

A TRIPLE-DECK OVEN-TUNNEL dries finished plywood panels and cools them for sanding at United States Plywood Corp., Orangeburg, S.C. The cooling is by both fans and refrigeration, while the drying is done with both counterflow and high-velocity air.

The 75'-long multi-pass installation, installed by J. O. Ross Engineering Div., Midland-Ross Corp., cools the panels after drying by passing them before a battery of fans which circulate room air over the panels. In summer, this air is exhausted to atmosphere, while in winter it is recirculated into the room.

Then the panels are sent into the refrigerated tunnel where they are brought down to room temperature. After being cooled, they are then sent to the sanding operation.

The multi-pass installation saves approximately 1500 sq.ft. of floor space by making use of otherwise wasted overhead space. Panels enter the oven after their final lacquer coatings.

circle 98 on reader service card

For Accurate TEMPERATURE RECORDS at MODERATE COST

RANGES AVAILABLE	
Temperature Range	One Rotation of Chart
-30° to + 150° F.	7 Days
-30° to + 120° F.	24 Hours
-30° to + 50° F.	24 Hours
-20° to + 40° F.	24 Hours
-10° to + 50° F.	7 Days
-10° to + 50° F.	24 Hours
-10° to + 50° F.	24 Hours
-20° to + 60° F.	24 Hours
-20° to + 60° F.	24 Hours
-40° to + 100° F.	24 Hours
-40° to + 100° F.	24 Hours
50° to 120° F.	24 Hours
60° to 90° F.	8 Hours
60° to 130° F.	24 Hours
70° to 130° F.	24 Hours
-25° to + 10°C.	24 Hours
5° to 40°C.	24 Hours



Use TEMPSCRIBE Recorders

BULB-TYPE (illustrated) — For recording temperatures at a distance

BI-METAL TYPE — For recording temperatures in surrounding air

- ✓ Portable—easily carried. Can be set on flat surface or hung on wall.
- ✓ Spring-wound instrument-type clock: 3 standard movements—8 hours, 24 hours or 7 days.
- ✓ Instrument measures 4 1/2" x 5 1/2" x 7 1/2"; uses 4 1/4" diameter charts.
- ✓ Chart graduations easy-to-read; spaced uniformly over full range.
- ✓ Pen and its actuating components are in door. Doors are completely interchangeable to convert to any temperature range, or from bi-metal type to bulb-type.

Also available: (1) Interchangeable doors with electro-magnetic armature to record running time of motors, burners, solenoid valves, etc. (2) Two-pen doors for recording temperature and electrical operation on same chart.

Write for Leaflets 766 and 872

BACHARACH INDUSTRIAL INSTRUMENT CO.
200 N. BRADDOCK AVE. • PITTSBURGH 8, PA. T-25

LA CROSSE QUALITY LEADS THEM ALL!



LA CROSSE DIRECT DRAW

Refrigerated faucets guarantee perfect beer temperature . . . no excessive foam . . . no morning "draw off". It's tops in design, engineering and efficiency.



KUBE KING . . . produces constant supply of crystal clean Kubes (approx. 3200 per 24 hours) . . . 110 lb. storage.



BOTTLE COOLER . . . self contained electric complete . . . up to 45% greater capacity! The all 'round leader.'



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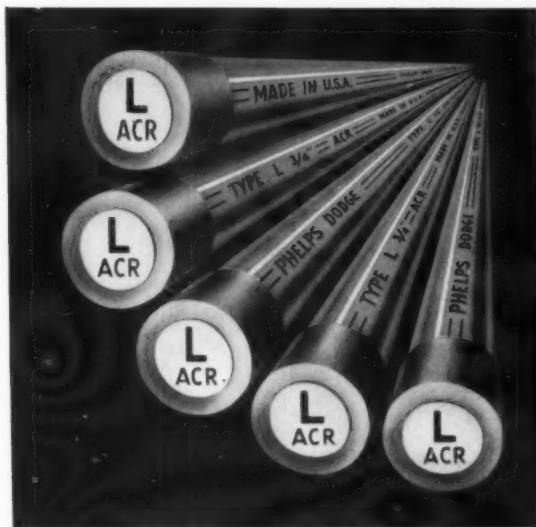
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What is this writer trying to say?

"In instances of mobile applications where fluid temperature due to intermittent operation and continued exposure remains low, a high-viscosity-index, low-pour-point fluid would be mandatory for reliable operation."

What he wants you to know is this:

"Machines used outdoors in winter need oil that isn't affected by the cold."

Well if that's what he meant, why didn't he say so? Good question. The reason you have to hack your way through doubletalk in technical and business magazines is that writing things clearly and simply is hard work—a lot harder and much more expensive than putting them down in technicalese (the special language of engineers and longhairs.) The odd part of this problem is that even the longhairs who *write* technicalese don't like to *read* it. That is why the articles in this magazine have been distilled.

Distilled Writing gives you facts without fluff

Our research department told us that we—like other publishers—were taking too much of our space and your time to get the facts across. That's where Distilled Writing comes in.

● **WHAT'S DISTILLED WRITING?** It's copy with the extra words squeezed out. It gives each article exactly as much space as it really needs . . . not one line more! This isn't a digesting process: all the facts are still there, but the verbiage is gone. For example, we take this kind of writing . . . and distill it to this:

eliminate unwanted vegetation kill weeds

It is used to rupture missile frames in flight to initiate aerodynamic disintegration. It makes missile frames explode in flight.

formation of iron oxide binding the two surfaces rusted together

● **HOW WE DEVELOPED DISTILLED WRITING.** First we hired Dr. David Kinsler to head up our distilling on a fulltime basis. He works with all our editorial staffs, teaching sharp, concise writing. Second, we retained Rubert Gunning, the top authority on readable writing, as our consultant. Third, we put every line of copy—whether staff-written or by an expert in the field—through the distilling process before it goes to the printer. Our whole editorial effort is aimed at telling the story brightly, clearly, briefly.

● **WHAT DOES THIS MEAN TO YOU?** The story that used to take four pages is now told in two or three. Shorter articles mean more of them in each issue. You get more information for your reading time and you don't have to dig it out. It takes more work for us to do it, but Distilled Writing pays off in the time it saves for our busy readers.



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